

SECTION A

THE NAME, CHEMICAL IDENTITY, AND  
COMPOSITION OF GLYPHOSATE

Please refer to letter of authorization, Page 3

Roundup® Ultra Herbicide  
EPA Reg. No. 524-475

This sample label is current as of March 4, 1997. The product descriptions and recommendations provided in this sample label are for background information only. Always refer to the label on the product before using Monsanto or any other agrochemical product.



## Complete Directions for Use

EPA Reg. No. 524-475

AVOID CONTACT OF HERBICIDE WITH FOLIAGE, GREEN STEMS, EXPOSED NON-WOODY ROOTS OR FRUIT OF CROPS, DESIRABLE PLANTS AND TREES, BECAUSE SEVERE INJURY OR DESTRUCTION MAY RESULT.

Roundup Ultra is a trademark of Monsanto Company.

1996-1

Z1137W4-2/CG

Read the entire label before using this product.

Use only according to label instructions.

It is a violation of Federal law to use this product in any manner inconsistent with its labeling.

Read the "LIMIT OF WARRANTY AND LIABILITY" statement at the end of the label before buying or using. If terms are not acceptable, return at once unopened.

REFORMULATION IS PROHIBITED. SEE INDIVIDUAL CONTAINER LABEL FOR REPACKAGING LIMITATIONS.

## 1.0 INGREDIENTS

### ACTIVE INGREDIENT:

\*Glyphosate, H-(phosphonomethyl)glycine, in the form of its isopropylamine salt

41.0%

INERT INGREDIENTS: 59.0%

100.0%

\*Contains 480 grams per litre or 4 pounds per U.S. gallon of the active ingredient glyphosate, in the form of its isopropylamine salt. Equivalent to 356 grams per litre or 3 pounds per U.S. gallon of the acid, glyphosate.

This product is protected by U.S. Patent No. 4,405,531. Other patents pending. No license granted under any non-U.S. patent(s).

## 2.0 IMPORTANT PHONE NUMBERS

1. FOR PRODUCT INFORMATION OR ASSISTANCE IN USING THIS PRODUCT, CALL TOLL-FREE:

1-800-4-A-MONROE

2. IN CASE OF AN EMERGENCY INVOLVING THIS PRODUCT, OR FOR MEDICAL ASSISTANCE, CALL COLLECT, DAY OR NIGHT:

1-800-4-A-MONROE

## 3.0 PRECAUTIONARY STATEMENTS

### 3.1 Hazards to Humans and Domestic Animals

Keep out of reach of children.

#### CAUTION!

CAUSES EYE IRRITATION.

Avoid contact with eyes or clothing.

FIRST AID: IF IN EYES, flush with plenty of water. Get medical attention if irritation persists.

DOMESTIC ANIMALS: This product is considered to be relatively nontoxic to dogs and other domestic animals; however, ingestion of this product or large amounts of freshly sprayed vegetation may result in temporary gastrointestinal irritation (vomiting, diarrhea, colic, etc.). If such symptoms are observed, provide the animal with plenty of fluids to prevent dehydration. Call a veterinarian if symptoms persist for more than 24 hours.

#### Personal Protective Equipment (PPE)

Applicators and other handlers must wear, long-sleeved shirt and long pants, shoes plus socks. Follow manufacturer's instructions for cleaning/maintaining PPE (Personal Protective Equipment). If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240 (d) (4-6)], the handler PPE requirements may be reduced or modified as specified in the WPS.

#### User Safety Recommendations:

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

## 3.2 Environmental Hazards

Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters.

## 3.3 Physical or Chemical Hazards

Spray solutions of this product should be mixed, stored and applied using only stainless steel, aluminum, fiberglass, plastic or plastic-lined steel containers.

DO NOT MIX, STORE OR APPLY THIS PRODUCT OR SPRAY SOLUTIONS OF THIS PRODUCT IN GALVANIZED STEEL OR UNLINED STEEL (EXCEPT STAINLESS STEEL) CONTAINERS OR SPRAY TANKS. This product or spray solutions of this product react with such containers and tanks to produce hydrogen gas which may form a highly combustible gas mixture. This gas mixture could flash or explode, causing serious personal injury, if ignited by open flame, spark, welder's torch, lighted cigarette or other ignition source.

## DIRECTIONS FOR USE

It is a violation of Federal law to use this product in any manner inconsistent with its labeling. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulations.

#### Agricultural Use Requirements

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE) and restricted entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application.

Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 4 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is: coveralls, waterproof gloves, shoes plus socks.

#### Non-Agricultural Use Requirements

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries or greenhouses.

Keep people and pets off treated areas until spray solution has dried to prevent transfer of this product onto desirable vegetation.

### 4.0 STORAGE AND DISPOSAL

Do not contaminate water, foodstuffs, feed or seed by storage or disposal.

See container label for STORAGE AND DISPOSAL instructions.

### 5.0 GENERAL INFORMATION (How this product works)

**Product Description:** This product is a postemergent, systemic herbicide with no soil residual activity. It is generally non-selective and gives broad spectrum control of many annual weeds, perennial weeds, woody brush and trees. It is formulated as a water-soluble liquid. No additional surfactants, additives containing surfactant, buffering agents or pH adjusting agents are needed or recommended. It may be applied through most standard industrial or field-type sprayers after dilution and thorough mixing with water or other carriers according to label instructions.

Do not add surfactants, additives containing surfactants, buffering agents or pH adjusting agents to this product. Ammonium sulfate may be used. See the MIXING section of this label for instructions.

**Time to Symptoms:** This product moves through the plant from the point of foliage contact to and into the root system. Visible effects on most annual weeds occur within 2 to 4 days, but on most perennial weeds may not occur for 7 days or more. Extremely cool or cloudy weather following treatment may slow activity of this product and delay development of visual symptoms. Visible effects are a gradual wilting and yellowing of the plant which advances to complete browning of above-ground growth and deterioration of underground plant parts.

**Stage of Weeds:** Annual weeds are easiest to control when they are small. Best control of most perennial weeds is obtained when treatment is made at late growth stages approaching maturity. Refer to the annual, perennial, woody brush and trees rate tables for recommendations for specific weeds.

Always use the higher rate of this product per acre within the recommended range when weed growth is heavy or dense or weeds are growing in an undisturbed (noncultivated) area.

Do not treat weeds under poor growing conditions such as drought stress, disease or insect damage, as reduced weed control may result. Reduced results may also occur when treating weeds heavily covered with dust.

**Cultural Considerations:** Reduced control may result when applications are made to annual or perennial weeds that have been mowed, grazed, or cut, and have not been allowed to regrow to the recommended stage for treatment.

**Reinfestations:** Heavy rainfall soon after application may wash this product off of the foliage and a repeat application may be required for adequate control.

**Spray Coverage:** For best results, spray coverage should be uniform and complete. Do not spray weed foliage to the point of runoff.

**Mode of Action:** The active ingredient in this product inhibits an enzyme found only in plants that is essential to formation of specific amino acids.

**No Soil Activity:** Weeds must be emerged at the time of application to be controlled by this product. Weeds germinating from seed after application will not be controlled. Unemerged plants arising from unattached underground rhizomes or root stocks of perennials will not be affected by the herbicide and will continue to grow.

When this product comes in contact with soil, it is bound to soil particles. Under recommended use situations, once this product is bound to soil particles, it is not available for plant uptake and will not harm off-site vegetation where roots grow into the treated area or if the soil is transported off-site. The strong affinity of this product to soil particles prevents this product from leaching out of the soil profile and entering ground water.

**Biological Degradation:** Degradation of this product is primarily a biological process carried out by soil microbes.

**Volatility:** Roundup Ultra is non-volatile. Therefore, it cannot move as a vapor after application to affect nearby vegetation.

**Toxicology Testing:** Exposure to workers and other applicators generally is expected to pose minimal risks based on results of short-term toxicity studies. Glyphosate has been thoroughly tested and determined not to cause cancer or other adverse long-term health effects.

**Tank Mixing:** This product does not provide residual weed control. For subsequent residual weed control, follow a label-approved herbicide program. Read and carefully observe the cautionary statements and all other information appearing on the labels of all herbicides used. Use according to the most restrictive label directions for each product in the mixture.

Buyer and all users are responsible for all loss or damage in connection with the use or handling of mixtures of this product with herbicides or other materials that are not expressly recommended in this labeling. Mixing this product with herbicides or other materials not recommended on this label may result in reduced performance.

**Annual Maximum Use Rate:** Except as otherwise specified in a crop section of this label, the combined total of all treatments must not exceed 8 quarts of this product per acre per year.

For noncrop uses, the combined total of all treatments must not exceed 10.6 quarts of this product per acre per year.

#### ATTENTION

AVOID CONTACT OF HERBICIDE WITH FOLIAGE, GREEN STEMS, EXPOSED NON-WOODY ROOTS OR FRUIT OF CROPS, DESIRABLE PLANTS AND TREES, BECAUSE SEVERE INJURY OR DESTRUCTION MAY RESULT.

AVOID DRIFT. EXTREME CARE MUST BE USED WHEN APPLYING THIS PRODUCT TO PREVENT INJURY TO DESIRABLE PLANTS AND CROPS.

Do not allow the herbicide solution to mist, drip, drift or splash onto desirable vegetation since minute quantities of this product can cause severe damage or destruction to the crop, plants or other areas on which treatment was not intended. The likelihood of injury occurring from the use of this product increases when winds are gusty, as wind velocity increases, when wind direction is constantly changing or when there are other meteorological conditions that favor spray drift. When spraying, avoid combinations of pressure and nozzle type that will result in splatter or fine particles (mist) which are likely to drift. AVOID APPLYING AT EXCESSIVE SPEED OR PRESSURE.

**NOTE:** Use of this product in any manner not consistent with this label may result in injury to persons, animals or crops, or other unintended consequences. Keep container closed to prevent spills and contamination.

## 6.0 MIXING

Clean sprayer parts immediately after using this product by thoroughly flushing with water.

**NOTE: REDUCED RESULTS MAY OCCUR IF WATER CONTAINING SOIL IS USED, SUCH AS VISIBLY MUDDY WATER OR WATER FROM PONDS AND DITCHES THAT IS NOT CLEAR.**

### 6.1 Mixing with Water

This product mixes readily with water. Mix spray solutions of this product as follows: Fill the mixing or spray tank with the required amount of water. Add the recommended amount of this product near the end of the filling process and mix well. Use caution to avoid siphoning back into the carrier source. Use approved anti-back-siphoning devices where required by state or local regulations. During mixing and application, foaming of the spray solution may occur. To prevent or minimize foam, avoid the use of mechanical agitators, terminate by-pass and return lines at the bottom of the tank and, if needed, use an approved anti-foam or defoaming agent.

### 6.2 Tank Mixing Procedure

Mix labeled tank mixtures of this product with water as follows:

1. Place a 20 to 35 mesh screen or wetting basket over filling port.
2. Through the screen, fill the spray tank one-half full with water and start agitation.
3. If a wettable powder is used, make a slurry with the water carrier, and add it SLOWLY through the screen into the tank. Continue agitation.
4. If a flowable formulation is used, premix one part flowable with one part water. Add diluted mixture SLOWLY through the screen into the tank. Continue agitation.
5. If an emulsifiable concentrate formulation is used, premix one part emulsifiable concentrate with two parts water. Add diluted mixture slowly through the screen into the tank. Continue agitation.
6. Continue filling the spray tank with water and add the required amount of this product near the end of the filling process.
7. Add individual formulations to the spray tank as follows: wettable powder, flowable, emulsifiable concentrate, drift control additive and water soluble liquid.

Maintain good agitation at all times until the contents of the tank are sprayed. If the spray mixture is allowed to settle, thorough agitation is required to resuspend the mixture before spraying is resumed.

Keep by-pass line on or near the bottom of the tank to minimize foaming. Screen size in nozzle or line strainers should be no finer than 50 mesh.

Always predetermine the compatibility of labeled tank mixtures of this product with water carrier by mixing small proportional quantities in advance.

Refer to the "Tank Mixing" section of "GENERAL INFORMATION" for additional precautions.

### 6.3 Mixing for Hand-held Sprayers

Prepare the desired volume of spray solution by mixing the amount of this product in water as shown in the following table:

#### Spray Solution

| Desired Volume | Amount of Roundup Ultra |           |          |          |        |  |
|----------------|-------------------------|-----------|----------|----------|--------|--|
|                | 1%                      | 1 1/2%    | 2%       | 5%       | 10%    |  |
| 1 Gal 8 oz     | 1 1/4 oz                | 2 oz      | 2 1/2 oz | 6 1/2 oz | 13 oz  |  |
| 25 Gal 1 pt    | 1 qt                    | 1 1/2 qt  | 2 qt     | 5 qt     | 10 qt  |  |
| 100 Gal 2 qt   | 1 gal                   | 1 1/2 gal | 2 gal    | 5 gal    | 10 gal |  |

2 tablespoons = 1 fluid ounce

For use in knapsack sprayers, it is suggested that the recommended amount of this product be mixed with water in a larger container. Fill sprayer with the mixed solution.

### 6.4 Ammonium Sulfate

The addition of 1 to 2 percent dry ammonium sulfate by weight or 8.5 to 17 pounds per 100 gallons of water may increase the performance of this product, particularly when tank mixed with certain residual herbicides on annual and perennial weeds. The equivalent rate of ammonium sulfate in a liquid formulation may also be used. Ensure that ammonium sulfate is completely dissolved in the spray tank before adding herbicides. Thoroughly rinse the spray system with clean water after use to reduce corrosion.

**NOTE:** When using ammonium sulfate, apply this product at rates recommended in this label. Lower rates will result in reduced performance.

### 6.5 Colorants or Dyes

Agriculturally-approved colorants or marking dyes may be added to this product. Colorants or dyes used in spray solutions of this product may reduce performance, especially at lower rates or dilutions. Use colorants or dyes according to the manufacturer's recommendations.

### 6.6 Drift Control Additives

Drift control additives may be used with all equipment types, except wiper applicators, sponge bars and CDA equipment. When a drift control additive is used, read and carefully observe the cautionary statements and all other information appearing on the additive label.

## 7.0 APPLICATION EQUIPMENT AND TECHNIQUES

Do not apply this product through any type of irrigation system.

This product may be applied with the following application equipment:

**Aerial—Fixed Wing and Helicopter**

**Ground Broadcast Spray—**Boom or boomless systems, pull-type sprayer, floaters, pick-up sprayers, spray couples and other ground broadcast equipment.

**Hand-Held and High-Volume Spray Equipment—**Knapsack and backpack sprayers, pump-up pressure sprayers, hand-guns, handwands, mistblowers\*, lances and other hand-held and motorized spray equipment used to direct the spray onto weed foliage.

\* This product is not registered in California or Arizona for use in mistblowers.

**Selective Equipment—**Recirculating sprayers, shielded and hooded sprayers, wiper applicators and sponge bars.

**Injection Systems—**Aerial or ground injection sprayers.

**Controlled Droplet Applicator (CDA)—**Hand-held or boom-mounted applicators which produce a spray consisting of a narrow range of droplet sizes.

APPLY THESE SPRAY SOLUTIONS IN PROPERLY MAINTAINED AND CALIBRATED EQUIPMENT CAPABLE OF DELIVERING DESIRED VOLUMES.

### 7.1 Aerial Equipment

DO NOT APPLY THIS PRODUCT USING AERIAL SPRAY EQUIPMENT EXCEPT UNDER CONDITIONS AS SPECIFIED WITHIN THIS LABEL.

Use the recommended rates of this herbicide in 3 to 15 gallons of water per acre unless otherwise specified on this label. Unless otherwise specified, do not exceed 1 quart per acre. Aerial applications of this product may be made in annual cropping conventional tillage systems, fallow and reduced tillage systems and preharvest applications. Refer to the individual use area sections of this label for recommended volumes and application rates.

FOR AERIAL APPLICATION IN CALIFORNIA, REFER TO THE FEDERAL SUPPLEMENTAL LABEL FOR AERIAL APPLICATIONS IN THAT STATE FOR SPECIFIC INSTRUCTIONS, RESTRICTIONS AND REQUIREMENTS. This product plus Banvel™ or 2,4-D tank mixtures may not be applied by air in California.

Avoid direct application to any body of water.

**AVOID DRIFT**—DO NOT APPLY DURING LOW-LEVEL INVERSION CONDITIONS. WHEN WINDS ARE GUSTY OR UNDER ANY OTHER CONDITION WHICH FAVORS DRIFT, DRIFT MAY CAUSE DAMAGE TO ANY VEGETATION CONTACTED TO WHICH TREATMENT IS NOT INTENDED. TO PREVENT INJURY TO ADJACENT DESIRABLE VEGETATION, APPROPRIATE BUFFER ZONES MUST BE MAINTAINED.

Coarse sprays are less likely to drift; therefore, do not use nozzles or nozzle configurations which dispense spray as fine spray droplets. Do not angle nozzles forward into the airstream and do not increase spray volume by increasing nozzle pressure.

Ensure uniform application—To avoid streaked, uneven or overlapped application, use appropriate marking devices.

Thoroughly wash aircraft, especially landing gear, after each day of spraying to remove residues of this product accumulated during spraying or from spills. PROLONGED EXPOSURE OF THIS PRODUCT TO UNCOATED STEEL SURFACES MAY RESULT IN CORROSION AND POSSIBLE FAILURE OF THE PART. LANDING GEAR ARE MOST SUSCEPTIBLE. The maintenance of an organic coating (paint), which meets aerospace specification MIL-C-38413, may prevent corrosion.

## 7.2 Ground Broadcast Equipment

Use the recommended rates of this product in 3 to 40 gallons of water per acre as a broadcast spray unless otherwise specified. As density of weeds increases, spray volume should be increased within the recommended range to ensure complete coverage. Carefully select proper nozzles to avoid spraying a fine mist. For best results with ground application equipment, use flat fan nozzles. Check for even distribution of spray droplets.

## 7.3 Hand-Held and High-Volume Equipment

Apply to foliage of vegetation to be controlled. For applications made on a spray-to-wet basis, spray coverage should be uniform and complete. Do not spray to the point of runoff. Use coarse sprays only.

For control of weeds listed in the annual weeds rate tables, apply a 0.5 percent solution of this product to weeds less than 6 inches in height or runner length. Apply prior to seed-head formation in grass or bud formation in broadleaf weeds. For annual weeds over 6 inches tall, or unless otherwise specified, use a 1 percent solution.

For best results, use a 2 percent solution on harder-to-control perennials, such as bermudagrass, dock, field bindweed, hemp dogbane, milkweed and Canada thistle.

When using application methods which result in less than complete coverage, use a 5 percent solution for annual and perennial weeds and a 5 to 10 percent solution for woody brush and trees.

## 7.4 Selective Equipment

This product may be applied through recirculating spray systems, shielded applicators, hooded sprayers, wiper applicators or sponge bars after dilution and thorough mixing with water to listed weeds growing in any noncrop site specified on this label and only when specifically recommended in cropping systems.

A recirculating spray system directs the spray solution onto weeds growing above desirable vegetation, while spray solution not intercepted by weeds is collected and returned to the spray tank for reuse.

A shielded or hooded applicator directs the herbicide solution onto weeds, while shielding desirable vegetation from the herbicide.

A wiper or sponge applicator applies the herbicide solution onto weeds by rubbing the weed with an absorbent material containing the herbicide solution.

**AVOID CONTACT OF HERBICIDE WITH DESIRABLE VEGETATION.**

Contact of the herbicide solution with desirable vegetation may result in damage or destruction. Applicators used above

desirable vegetation should be adjusted so that the lowest spray stream or wiper contact point is at least 2 inches above the desirable vegetation. Droplets, mist, foam, or splatter of the herbicide solution settling on desirable vegetation may result in discoloration, stunting or destruction.

Applications made above the crops should be made when the weeds are a minimum of 6 inches above the desirable vegetation. Better results may be obtained when more of the weed is exposed to the herbicide solution. Weeds not contacted by the herbicide solution will not be affected. This may occur in dense clumps, severe infestations or when the height of the weeds varies so that not all weeds are contacted. In these instances, repeat treatment may be necessary.

### Shielded and hooded applicators

Use nozzles that provide uniform coverage within the treated area. Keep shields on these sprayers adjusted to protect desirable vegetation. **EXTREME CARE MUST BE EXERCISED TO AVOID CONTACT OF HERBICIDE WITH DESIRABLE VEGETATION.**

### Wiper applicators and sponge bars

Wiper applicators are devices that physically wipe appropriate amounts of this product directly onto the weed.

Equipment must be designed, maintained and operated to prevent the herbicide solution from contacting desirable vegetation. Operate this equipment at ground speeds no greater than 5 mph. Performance may be improved by reducing speed in areas of heavy weed infestations to ensure adequate wiper saturation. Better results may be obtained if 2 applications are made in opposite directions.

Avoid leakage or dripping onto desirable vegetation. Adjust height of applicator to ensure adequate contact with weeds. Keep wiping surfaces clean. Be aware that, on sloping ground, the herbicide solution may migrate, causing dripping on the lower end and drying of the wicks on the upper end of a wiper applicator.

Do not use wiper equipment when weeds are wet.

Mix only the amount of solution to be used during a 1-day period, as reduced activity may result from use of leftover solutions. Clean wiper parts immediately after using this product by thoroughly flushing with water.

Do not add surfactant to the herbicide solution.

**For Rope or Sponge Wick Applicators**—Mix 1 gallon of this product in 2 gallons of water to prepare a 33 percent solution. Apply this solution to weeds listed in this section.

**For Porous-Plastic Applicators**—Solutions ranging from 33 to 100 percent of this product in water may be used in porous-plastic wiper applicators.

When applied as recommended, this product **CONTROLS** the following weeds:

|                 |                  |
|-----------------|------------------|
| Corn, volunteer | Sicklepod        |
| Panicum, Texas  | Spanishneedles   |
| Rye, common     | Starbur, bristly |
| Shattercane     |                  |

When applied as recommended, this product **SUPPRESSES** the following weeds:

|                        |                 |
|------------------------|-----------------|
| Beggarweed, Florida    | Ragweed, common |
| Bermudagrass           | Ragweed, giant  |
| Dogbane, hemp          | Smutgrass       |
| Dogfennel              | Sunflower       |
| Guineagrass            | Thistle, Canada |
| Johnsongrass           | Thistle, musk   |
| Milkweed               | Vaseygrass      |
| Nightshade, silverleaf | Velvetleaf      |
| Pigweed, redroot       |                 |

## 7.5 Injection Systems

This product may be used in aerial or ground injection spray systems. It may be used as a liquid concentrate or diluted prior to injecting into the spray stream. Do not mix this product with the concentrate of other products when using injection systems.

## 7.6 CDA Equipment

The rate of this product applied per acre by vehicle-mounted CDA equipment must not be less than the amount recommended in this label when applied by conventional broadcast equipment. For vehicle-mounted CDA equipment, apply 3 to 15 gallons of water per acre.

For the control of annual weeds with hand-held CDA units, apply a 20 percent solution of this product at a flow rate of 2 fluid ounces per minute and a walking speed of 1.5 mph (1 quart per acre). For the control of perennial weeds, apply a 20 to 40 percent solution of this product at a flow rate of 2 fluid ounces per minute and a walking speed of 0.75 mph (2 to 4 quarts per acre).

Controlled droplet application equipment produces a spray pattern which is not easily visible. Extreme care must be exercised to avoid spray or drift contacting the foliage or any other green tissue of desirable vegetation, as damage or destruction may result.

## 8.0 CROPS (Alphabetical)

This section is organized alphabetically by crop category. There may be several labeled crops listed in a crop category. Unless otherwise specified, applications may be made to control any weeds listed in the annual, perennial and woody bush tables. Also refer to the "SELECTIVE EQUIPMENT" section.

For any crop not listed in this "CROPS" section, applications must be made at least 30 days prior to planting.

For broadcast postemergent treatments, do not harvest or feed treated vegetation for 8 weeks following application, unless otherwise specified.

When applying this product prior to transplanting crops into plastic mulch, residues must be removed from the plastic by 0.5 inches of water via sprinkler irrigation or natural rainfall.

## 8.1 Alfalfa, Clover, and Other Forage Legumes

**LABELED CROPS:** Alfalfa, clover, kudzu, lespedeza, lupin, sainfoin, trefoil, velvet bean, vetch, crown vetch, milk vetch

**TYPES OF APPLICATIONS:** Preplant, preemergence, at-planting, spot treatment, wiper applications, renovation, preharvest

**Preplant, Preemergence and At-planting**  
**USE INSTRUCTIONS:** This product may be applied before, during or after planting alfalfa and clover. Applications must be made prior to emergence of the crop.

**PRECAUTIONS, RESTRICTIONS:** Remove domestic livestock before application and wait 8 weeks after application before grazing or harvesting.

**Preharvest (Alfalfa only)**

**USE INSTRUCTIONS:** This product may be used in declining alfalfa stands or any stand of alfalfa where crop destruction is acceptable. This application will severely injure or destroy the stand of alfalfa. This product will control annual and perennial weeds, including quackgrass, when applied prior to the harvest of alfalfa. The treated crop and weeds can be harvested and fed to livestock after 36 hours. Allow a minimum of 36 hours between application and harvest. Applications may be made at any time of the year. Make only one application to an existing stand of alfalfa per year. For control of quackgrass, apply in the spring, late summer or fall when quackgrass is actively growing. Treatments for quackgrass must be followed by deep tillage for complete control.

**PRECAUTIONS, RESTRICTIONS:** Do not apply more than 1 quart of this product per acre as a preharvest treatment. Do not use for alfalfa grown for seed, as a reduction in germination or vigor may occur.

**Spot treatment or Wiper applications (Alfalfa and Clover only)**

**USE INSTRUCTIONS:** This product may be applied as a spot treatment in alfalfa or clover. This product may be applied with wiper applicators to control or suppress the weeds listed under "WIPER APPLICATORS" in the "SELECTIVE EQUIPMENT" section of this label. Applications may be made in the same area at 30-day intervals.

**PRECAUTIONS, RESTRICTIONS:** For spot treatment and wiper applications, apply in areas where the movement of domestic livestock can be controlled. No more than one-tenth of any acre should be treated at one time. Remove domestic livestock before application and wait 14 days after application before grazing livestock or harvesting.

**Renovation**

**USE INSTRUCTIONS:** This product may be applied as a broadcast spray to existing stands of alfalfa, clover, and other labeled forage legumes. Labeled crops may be planted into the treated area.

**PRECAUTIONS, RESTRICTIONS:** Remove domestic livestock before application and wait 8 weeks after application before grazing or harvesting.

## 8.2 Asparagus

**TYPES OF APPLICATIONS:** Preplant, preemergence, spot treatment, postharvest

**Preplant, Preemergence**

**USE INSTRUCTIONS:** This product may be applied prior to emergence of asparagus.

**PRECAUTIONS, RESTRICTIONS:** Do not apply within a week before the first spears emerge.

**Spot treatment**

**USE INSTRUCTIONS:** This product may be applied immediately after cutting, but prior to the emergence of new spears.

**PRECAUTIONS, RESTRICTIONS:** Do not treat more than 10 percent of the total field area to be harvested. Do not harvest within 5 days of treatment.

**Postharvest**

**USE INSTRUCTIONS:** This product may be applied after the last harvest and all spears have been removed. If spears are allowed to regrow, delay application until ferns have developed. Delayed treatments should be applied as a directed or shielded spray in order to avoid contact of the spray with ferns, stems or spears.

**PRECAUTIONS, RESTRICTIONS:** Direct contact of the spray with the asparagus may result in serious crop injury. Select and use recommended types of spray equipment for postemergence postharvest applications. A directed spray is any application where the spray pattern is aligned in such a way as to avoid direct contact of the spray with the crop. A shielded spray is any application where a physical barrier is positioned and maintained between the spray and the crop to prevent contact of spray with the crop.

## 8.3 Cereal Crops

**LABELED CROPS:** Barley, Buckwheat, Millet (Pearl, Proso), Oats, Rice, Rye, Teosinte, Trifoliate, Wheat (All), Wild rice

**TYPES OF APPLICATIONS:** Preplant, preemergence, at-planting, spot treatment (except rice), post-harvest, preharvest (wheat only), wiper applicators (wheat only)

Do not treat rice fields or levees when the field contains flood water.

**Preplant, Preemergence and At-planting**

**USE INSTRUCTIONS:** This product may be applied before, during or after planting of cereal crops. Applications must be made prior to emergence of the crop.

**Spot treatment (except rice)**

**USE INSTRUCTIONS:** This product may be applied as a spot treatment in cereal crops. Apply this product before heading in small grains.

**PRECAUTIONS, RESTRICTIONS:** Do not treat more than 10 percent of the total field area to be harvested. The crop receiving spray in the treated area will be killed. Take care to avoid drift or spray outside target area for the same reason.

**Postharvest**

**USE INSTRUCTIONS:** This product may be applied after harvest of cereal crops. Higher rates may be required for control of large weeds which were growing in the crop at the time of harvest. Tank mixtures with 2,4-D or dicamba may be used.

**PRECAUTIONS, RESTRICTIONS:** For any crop not listed on this label, applications must be made at least 30 days prior to planting the next crop. Do not harvest or feed treated vegetation for 8 weeks following application.

**Preharvest (wheat only)**

**USE INSTRUCTIONS:** This product provides weed control when applied prior to harvest of wheat. Apply after the hard-dough stage of grain (30% or less grain moisture) and at least 7 days prior to harvest. Wheat stubble may be grazed immediately after harvest.

This product may be applied using either aerial or ground spray equipment. For ground applications, apply this product in 10 to 20 gallons of water per acre. For aerial applications, apply this product in 3 to 10 gallons of water per acre.

**PRECAUTIONS, RESTRICTIONS:** Do not apply more than 1 quart of this product per acre. Do not apply to wheat grown for seed, as a reduction in germination or vigor may occur.

**Wiper applications (wheat only)**

**USE INSTRUCTIONS:** Wiper applications may be used in wheat. To control common rye or cereal rye, apply after the weeds have headed and achieved maximum growth, when the rye is at least 6 inches above the wheat crop.

**PRECAUTIONS, RESTRICTIONS:** Allow at least 35 days between application and harvest. Do not use roller applicators.

## 8.4 Christmas Trees

**TYPES OF APPLICATIONS:** Post-directed, spot treatment, site preparation

**Post-directed, Spot treatment**

**USE INSTRUCTIONS:** This product may be used as a post-directed spray and spot treatment around established Christmas trees.

**PRECAUTIONS, RESTRICTIONS:** Desirable plants may be protected from the spray solution by using shields or coverings made of cardboard or other impermeable material. **THIS PRODUCT IS NOT RECOMMENDED FOR USE AS AN OVER-TOP BROADCAST SPRAY IN CHRISTMAS TREES.** Care must be exercised to avoid contact of spray, drift or mist with foliage or green bark of established Christmas trees.

**Site preparation**

**USE INSTRUCTIONS:** This product may be used prior to planting Christmas trees.

**PRECAUTIONS, RESTRICTIONS:** Precautions should be taken to protect nontarget plants during site preparation applications.

## 8.5 Citrus Crops

**LABELLED CROPS:** Calamondin, Citronia, Citron, Citrus Hybrids, Grapefruit, Kumquat, Lemon, Lime, Mandarin (Lamprose), Orange (AZ), Pummelo, Tangelo, Tangerine

**TYPES OF APPLICATIONS:** General weed control, middles (between rows of trees), strips (in row of trees), selective equipment

**NOTE:** FOR GENERAL USE DIRECTIONS, SEE THE "TREE, NUT AND VINE (GENERAL)" SECTION. THE FOLLOWING DIRECTIONS ARE SPECIFIC TO CITRUS CROPS.

**Florida and Texas only:** For burndown or control of the weeds listed below, apply the recommended rates of this product in 3 to 30 gallons of water per acre. Where weed foliage is dense, use 10 to 30 gallons of water per acre.

For goatweed, apply 2 to 3 quarts of this product per acre. Apply in 20 to 30 gallons of water per acre when plants are actively growing. Use 2 quarts per acre when plants are less than 8 inches tall and 3 quarts per acre when plants are greater than 8 inches tall. If goatweed is greater than 8 inches tall, the addition of Krovat™ II or Karmex™ may improve control. Refer to the individual product labels for specific crops, rates, geographic restrictions and precautionary statements.

**Perennial weeds:**

| Weed Species            | S=Suppression<br>PC=Partial Control |      | B=Burndown<br>C=Control |      |      |      |
|-------------------------|-------------------------------------|------|-------------------------|------|------|------|
|                         | Roundup Ultra                       | Rate | Per Acre                | 1 QT | 2 QT | 3 QT |
| Bermudagrass            | 8                                   | —    | PC                      | C    |      |      |
| Guineagrass             |                                     |      |                         |      |      |      |
| Texas and Florida Ridge | B                                   | C    | C                       | C    |      |      |
| Florida Flatwoods       | —                                   | B    | C                       | C    |      |      |
| Paragrass               | B                                   | C    | C                       | C    |      |      |
| Torpedograss            | S                                   | —    | PC                      | C    |      |      |

**PRECAUTIONS, RESTRICTIONS:** Allow a minimum of 1 day between last application and harvest.

## 8.6 Conservation Reserve Program (CRP)

**TYPES OF APPLICATIONS:** Renovation (rotating out of CRP), site preparation, dormant, wiper

**Rotating out of CRP, Site preparation**

**USE INSTRUCTIONS:** This product may be used to prepare CRP land for crop production.

**Dormant, Wiper**

**USE INSTRUCTIONS:** This product may be used to suppress competitive growth and seed production of undesirable vegetation in CRP acres. Such applications may be made with wiper application equipment or as a broadcast or spot treatment to dormant CRP grasses. For selective applications with broadcast spray equipment, apply 12 to 16 fluid ounces of this product per acre in early spring before desirable CRP grasses, such as crested and tall wheatgrass, break dormancy and initiate green growth. Late fall applications can be made after desirable perennial grasses have reached dormancy.

**PRECAUTIONS, RESTRICTIONS:** Some stunting of CRP perennial grasses will occur if broadcast applications are made when plants are not dormant.

## 8.7 Corn

**TYPES OF CORN:** Field corn, seed corn, sweet corn and popcorn

**TYPES OF APPLICATIONS:** Preplant, preemergence, at-planting, spot treatment, post-harvest

**Preplant, Preemergence and At-planting**

**USE INSTRUCTIONS:** This product may be applied before, during or after planting corn. Applications must be made prior to emergence of the crop.

The following tank mixtures may be applied before, during or after planting in conventional tillage systems, into a cover crop, established sod or in previous crop residue.

Apply these tank mixtures in 10 to 20 gallons of water or 10 to 60 gallons of nitrogen solution per acre. For Southern states, do not apply in nitrogen solutions to tough-to-control grasses such as barnyardgrass, fall panicum, broadleaf signalgrass, annual ryegrass and any perennial weeds. See the map in the Annual Weeds section of this label for areas included in this recommendation.

|                  |                    |             |
|------------------|--------------------|-------------|
| ATRAZINE         | EXTRAZINE™         | LOROX™      |
| BANVEL           | FRONTIER™          | MARKSAM™    |
| BICEP™           | GUARDSAAM™         | MICRO-TECH™ |
| BICEP II         | HARNESS™           | PARTNER™    |
| BLADEC/MYANAZINE | HARNESS XTRA       | PROWL™      |
| BROADSTRIKE™     | HARNESS XTRA S & L | SURPASS™    |
| BULLET™          | LARIAT™            | SURPASS 100 |
| QUAL™            | LASSO™/ALACHLOR    | TORNATCH™   |
| QUAL II          | LINEX™             |             |

For improved burndown, this product may be tank mixed with 2,4-D or dicamba.

**Annual weeds—**For difficult-to-control weeds such as fall panicum, barnyardgrass, crabgrass, shattercane and broadleaf signalgrass up to 2 inches tall, and Pennsylvania smartweed up to 6 inches tall, apply this product at 2 pints per acre in these tank mixtures. For other labeled annual weeds, apply 1 to 1.5 pints of this product per acre when weeds are less than 6 inches tall, and 2 to 3 pints when weeds are over 6 inches tall.

**PRECAUTIONS, RESTRICTIONS:** Applications of 2,4-D or dicamba must be made at least 7 days prior to planting corn.

The tank mix recommendations in this section are not registered in California.

**Spot treatment**

**USE INSTRUCTIONS:** For spot treatments, apply this product prior to silking of corn.

**PRECAUTIONS, RESTRICTIONS:** Do not treat more than 10 percent of the total field area to be harvested. The crop receiving spray in the treated area will be killed. Take care to avoid drift or spray outside target area for the same reason.

**Post-harvest**

**USE INSTRUCTIONS:** This product may be applied after harvest of corn. Higher rates may be required for control of large weeds which were growing in the crop at the time of harvest. Tank mixtures with 2,4-D or dicamba may be used.

**PRECAUTIONS, RESTRICTIONS:** Do not harvest or feed treated vegetation for 8 weeks following application.

## 8.8 Cotton

**TYPES OF APPLICATIONS:** Preplant, preemergence, at-planting, hooded sprayer, selective equipment, spot treatment, preharvest

**Preplant, Preemergence, and At-planting**

**USE INSTRUCTIONS:** This product may be applied before, during or after planting cotton. Applications must be made prior to emergence of the crop.

**Hooded sprayer, Selective equipment**

**USE INSTRUCTIONS:** This product may be applied through hooded sprayers, recirculating sprayers, shielded applicators or wiper applicators in cotton. Allow at least 7 days between application and harvest.

**PRECAUTIONS, RESTRICTIONS:** See the "SELECTIVE EQUIPMENT" part of the "APPLICATION EQUIPMENT AND TECHNIQUES" section of this label for information on proper use and calibration of this equipment.

**Spot treatment**

**USE INSTRUCTIONS:** For spot treatments, apply this product prior to boll opening of cotton.

**PRECAUTIONS, RESTRICTIONS:** Do not treat more than 10 percent of the total field area to be harvested. The crop receiving spray in treated area will be killed. Take care to avoid drift or spray outside target area for the same reason.

**Preharvest**

**USE INSTRUCTIONS:** This product provides weed control and cotton regrowth inhibition when applied prior to harvest of cotton. For weed control, apply at rates given in the annual, perennial and woody brush tables. Apply 1 pint to 2 quarts of this product per acre for cotton regrowth inhibition. Allow a minimum of 7 days between application and harvest of cotton.

This product may be applied using either aerial or ground spray equipment. For ground applications, apply this product in 10 to 20 gallons of water per acre. For aerial applications, apply this product in 3 to 10 gallons of water per acre.

Apply after sufficient bolls have developed to produce the desired yield of cotton. Applications made prior to this time could affect maximum yield potential.

This product may be tank mixed with DEF<sup>®</sup> 6, Folex<sup>™</sup>, or Prep<sup>™</sup> to provide additional enhancement of cotton leaf drop.

**PRECAUTIONS, RESTRICTIONS:** Do not feed or graze treated cotton forage or hay following preharvest applications. DO NOT APPLY MORE THAN 1 QUART OF THIS PRODUCT PER ACRE BY AIR. Do not apply more than 2 quarts of this product per acre by ground. Do not apply to cotton grown for seed, as a reduction in germination or vigor may occur.

## 8.9 Fallow Systems

**TYPES OF APPLICATIONS:** Chemical fallow, preplant fallow beds, aid-to-tillage

**Chemical fallow**

**USE INSTRUCTIONS:** This product may be applied during the fallow period prior to planting or emergence of any crop listed on this label. For any crop not listed on this label, applications must be made at least 30 days prior to planting. This product may be used as a substitute for tillage to control annual weeds in fallow fields. Also, broadcast or spot treatments will control or suppress many perennial weeds in fallow fields. Ground or aerial application equipment may be used. Tank mixtures with 2,4-D and dicamba may be used.

**PRECAUTIONS, RESTRICTIONS:** DO NOT APPLY BANVEL OR 2,4-D TANK MIXTURES BY AIR IN CALIFORNIA.

Refer to the specific product labels for crop rotation restrictions and cautionary statements of all products used in tank mixtures. Some crop injury may occur if Banvel is applied within 45 days of planting.

**Preplant fallow beds**

**USE INSTRUCTIONS:** This product may be applied to fallow beds prior to planting or emergence of any crop listed on this label. For any crop not listed on this label, applications must be made at least 30 days prior to planting. This product will control weeds listed in the annual, perennial and woody brush tables.

In addition, 12 fluid ounces of this product plus 2 to 3 oz of Goal<sup>™</sup> 2XL per acre will control the following weeds with the maximum height or length indicated: 3" — common cheeseweed, chickweed, groundsel; 6" — London rocket, shepherd's-purse.

16 fluid ounces of this product plus 2 to 3 oz of Goal 2XL per acre will control the following weeds with the maximum height or length indicated: 6" — common cheeseweed, groundsel, marehail (*Conyza canadensis*), 12" — chickweed, London rocket, shepherd's-purse.

**Aid-to-tillage**

**USE INSTRUCTIONS:** This product may be used in conjunction with tillage practices in fallow systems or preplant to labeled crops to control downy brome, cheat, volunteer wheat, tansy mustard and foxtail. Apply 8 fluid ounces of this product in 3 to 10 gallons of water per acre. Make applications before weeds are 6 inches in height. Application must be followed by conventional tillage practices no later than 15 days after treatment and before regrowth occurs. Allow at least 1 day after application before tillage.

**PRECAUTIONS, RESTRICTIONS:** Tank mixtures with residual herbicides may result in reduced performance.

## 8.10 Grain Sorghum (Milo)

**TYPES OF APPLICATIONS:** Preplant, preemergence, at-planting, spot treatment, wiper applicators, post-harvest

**Preplant, Preemergence, At-planting**

**USE INSTRUCTIONS:** This product may be applied before, during or after planting grain sorghum. Applications must be made prior to emergence of the crop.

**Spot treatment and Wiper applications**

**USE INSTRUCTIONS:** This product may be applied as a spot treatment in grain sorghum. Make spot treatments before heading of milo. This product may be applied with wiper applicators to control or suppress the weeds listed under "WIPER APPLICATORS" in the "SELECTIVE EQUIPMENT" section of this label.

**PRECAUTIONS, RESTRICTIONS:** For spot treatment, do not treat more than 10 percent of the total field area to be harvested. The crop receiving spray in treated area will be killed. Take care to avoid drift or spray outside target area for the same reason.

For wiper applicators, allow at least 40 days between application and harvest. Do not use roller applicators. Do not feed or graze treated milo fodder. Do not ensile treated vegetation.

**Post-harvest**

**USE INSTRUCTIONS:** This product may be applied after harvest of grain sorghum. Higher rates may be required for control of large weeds which were growing in the crop at the time of harvest. Tank mixtures with 2,4-D or dicamba may be used.

This product may be applied to grain sorghum (milo) stubble following harvest to suppress or control regrowth. Apply 1 quart of this product per acre for control, or 1.5 pints of this product per acre for suppression.

**PRECAUTIONS, RESTRICTIONS:** Do not harvest or feed treated vegetation for 8 weeks following application.

## 8.11 Grass Seed Production

**TYPES OF APPLICATIONS:** Preplant, renovation, site preparation

**USE INSTRUCTIONS:** Applications may be made prior to planting or renovation of turf or forage grass areas grown for seed production. For maximum control of existing vegetation, delay planting to determine if any regrowth from escaped underground plant parts occurs. Where repeat treatments are necessary, sufficient regrowth must be attained prior to application. For warm-season grasses, such as bermudagrass, summer or fall applications provide best control.

**PRECAUTIONS, RESTRICTIONS:** Do not disturb soil or underground plant parts before treatment. Tillage or renovation techniques such as vertical mowing, coring or slicing should be delayed for 7 days after application to allow proper translocation into underground plant parts.

Do not feed or graze treated areas for 8 weeks following application.



## 8.12 Herbs

**TYPES OF HERBS:** Peppermint, spearmint

**USE INSTRUCTIONS:** This product may be used as a spot treatment in spearmint and peppermint. Apply spray-to-wet with hand-held equipment, such as backpack and knapsack sprayers, pump-up pressure sprayers, hand-guns, hand-wands or any other hand-held or motorized spray equipment used to direct the spray solution on to a limited area.

**PRECAUTIONS, RESTRICTIONS:** Allow at least 7 days between application and harvest. Further applications may be made in the same area at 30 day intervals. No more than one-tenth of any acre should be treated at one time. The crop receiving spray in the treated area will be killed. Take care to avoid drift or spray outside the target area for this reason.

## 8.13 Pastures

**TYPES OF PASTURES:** Bahiagrass, bermudagrass, bluegrass, brome, fescue, orchardgrass, ryegrass, timothy, wheatgrass, alfalfa and clover

**TYPES OF APPLICATIONS:** Spot treatment, wiper application, preplant, preemergence, pasture renovation

**Spot treatment and Wiper application**

**USE INSTRUCTIONS:** This product may be applied as a spot treatment or with wiper applicators in pastures. Applications may be made in the same area at 30-day intervals.

**PRECAUTIONS, RESTRICTIONS:** For spot treatment and wiper applications, apply in areas where the movement of domestic livestock can be controlled. No more than one-tenth of any acre should be treated at one time. Remove domestic livestock before application and wait 14 days after application before grazing livestock or harvesting.

**Preplant, Preemergence and Pasture renovation**

**USE INSTRUCTIONS:** This product may be applied prior to planting or emergence of forage grasses and legumes. In addition, this product may be used to control perennial pasture species listed on this label prior to re-planting.

**PRECAUTIONS, RESTRICTIONS:** Remove domestic livestock before application and wait 8 weeks after application before grazing or harvesting.

## 8.14 Peanuts

**TYPES OF APPLICATIONS:** Preplant, preemergence, at-planting

**USE INSTRUCTIONS:** This product may be applied before, during or after planting peanuts. Applications must be made prior to the emergence of the crop.

## 8.15 Small Fruits and Berries

**LABELED CROPS:** Blackberry, Blueberry, Boysenberry, Cranberry, Currant, Dewberry, Elderberry, Gooseberry, Huckleberry, Loganberry, Claliebery, Raspberry (Black, Red), Youngberry

**TYPES OF APPLICATIONS:** Preplant, preemergence, directed spray (except cranberry), wiper application

**USE INSTRUCTIONS:** This product may be applied as a pre-plant or preemergence broadcast application or as a wiper application for crops listed in this section. Directed sprays may be applied to any crop except cranberries. For wick or wiper applicators, mix 1 gallon of this product in 4 gallons of water to prepare a 20 percent solution. In severe infestations, reduce equipment ground speed to ensure that adequate amounts of this product are wiped on the weeds. A second treatment in the opposite direction may be beneficial.

**PRECAUTIONS, RESTRICTIONS:** Do not permit herbicide solution to contact desirable vegetation, including green shoots, canes or foliage. Allow a minimum of 30 days between last application and harvest of cranberries. For other small fruits and berries, allow a minimum of 14 days between last application and harvest.

## 8.16 Soybeans

**TYPES OF APPLICATIONS:** Preplant, preemergence, at-planting, spot treatment, preharvest, selective equipment, hooded sprayers

**Preplant, Preemergence and At-planting**

**USE INSTRUCTIONS:** This product may be applied before, during or after planting soybeans. Applications must be made prior to emergence of the crop.

The following tank mixtures may be applied before, during or after planting in conventional tillage systems, into a cover crop, established sod or in previous crop residue.

|          |                |                 |
|----------|----------------|-----------------|
| CANOPY™  | LESSO/ALACHLOR | PROWL           |
| COMMAND™ | LINEX          | PURSUIT™        |
| DUAL     | LOROX/LINURON  | PURSUIT PLUS    |
| DUAL II  | LOROX PLUS     | SCEPTER™        |
| FRONTIER | MICRO-TECH     | SENCOR™/LEXONE™ |
| FUSION™  | PARTNER        | SQUADRON™       |
| GEMINI™  | PREVIEW™       | TURBO™          |

For improved burndown, this product may be tank-mixed with 2,4-D or 2,4-DB. See the 2,4-D label for intervals between application and planting.

**Annual weeds:** For difficult-to-control weeds such as fall panicum, barnyardgrass, crabgrass, shattercane and broadleaf signalgrass up to 2 inches tall, and Pennsylvania smartweed up to 6 inches tall, apply this product at 2 pints per acre in these tank mixtures. For other labeled annual weeds, apply 1 to 1.5 pints of this product per acre when weeds are less than 6 inches tall, and 2 to 3 pints when weeds are over 6 inches tall.

**PRECAUTIONS, RESTRICTIONS:** The tank mix recommendations in this section are not registered in California.

**Spot treatment**

**USE INSTRUCTIONS:** For spot treatments, apply this product prior to initial pod set in soybeans.

**PRECAUTIONS, RESTRICTIONS:** Do not treat more than 10 percent of the total field area to be harvested. The crop receiving spray in treated area will be killed. Take care to avoid drift or spray outside target area for the same reason.

**Preharvest**

**USE INSTRUCTIONS:** This product provides weed control when applied prior to harvest of soybeans.

Apply at rates given in the annual, perennial and woody brush tables. This product may be applied using either aerial or ground spray equipment. For ground applications, apply this product in 10 to 20 gallons of water per acre. For aerial applications, apply this product in 3 to 10 gallons of water per acre.

Apply after pods have set and lost all green color. Allow a minimum of 7 days between application and harvest of soybeans. Care should be taken to avoid excessive seed shatter loss due to ground application equipment.

**PRECAUTIONS, RESTRICTIONS:** Do not graze or harvest treated crop for livestock feed within 25 days of last preharvest application. DO NOT APPLY MORE THAN 6 QUARTS PER ACRE OF THIS PRODUCT FOR PREHARVEST APPLICATIONS. DO NOT APPLY MORE THAN 1 QUART PER ACRE OF THIS PRODUCT BY AIR. Do not apply to soybeans grown for seed as a reduction in germination or vigor may occur.

**Selective equipment**

**USE INSTRUCTIONS:** This product may be applied through recirculating sprayers, shielded applicators, hooded sprayers, wiper applicators or sponge bars in soybeans. Allow at least 7 days between application and harvest.

**PRECAUTIONS, RESTRICTIONS:** See the "SELECTIVE EQUIPMENT" part of the "APPLICATION EQUIPMENT AND TECHNIQUES" section of this label for information on proper use and calibration of this equipment.

## 8.17 Sugarcane

**TYPES OF APPLICATIONS:** Preplant, preemergence, spot treatment, fallow, hooded sprayers

**Preplant, Preemergence**

**USE INSTRUCTIONS:** This product may be applied in or around sugarcane fields or in fields prior to the emergence of plant cane.

**PRECAUTIONS, RESTRICTIONS:** Do not apply to vegetation in or around ditches, canals or ponds containing water to be used for irrigation.

**Spot treatment**

**USE INSTRUCTIONS:** This product may be applied as a spot treatment in sugarcane. For control of volunteer or diseased

sugarcane, make a 1 percent solution of this product in water and spray to wet the foliage of vegetation to be controlled. Volunteer or diseased sugarcane should have at least 7 new leaves.

**PRECAUTIONS, RESTRICTIONS:** Avoid spray contact with healthy cane plants since severe damage or destruction may result. Do not feed or graze treated sugarcane foliage following application.

#### Fallow treatments

**USE INSTRUCTIONS:** This product may be used as a replacement for tillage in fields that are lying fallow between sugarcane crops. This product may also be used to remove the last stubble of ratoon cane. For removal of last stubble of ratoon cane, apply 4 to 5 quarts of this product in 10 to 40 gallons of water per acre to new growth having at least 7 new leaves. Allow 7 or more days after application before tillage.

#### Hooded sprayers

**USE INSTRUCTIONS:** This product may be used through hooded sprayers for weed control between the rows of sugarcane. A hooded sprayer is a type of shielded applicator. The spray pattern is completely enclosed on the top and all 4 sides by a hood, thereby shielding the crop from the spray solution.

Minimize the potential for spray particles to escape from under the hood by operating the sprayer at appropriate ground speeds, nozzle pressures and wind speeds. Operation on rough or sloping ground may result in spray particles escaping from the hood.

When applying to sugarcane that is grown on raised beds, ensure that the hood is designed to completely enclose the spray. If necessary, extend the front and rear flaps of the hoods to reach the ground in furrows between the rows.

Equipment must be designed, maintained and operated to prevent the herbicide solution from contacting the crop. Contact of this product in any manner to any vegetation to which treatment is not intended may cause damage. Such damage shall be the sole responsibility of the applicator.

**PRECAUTIONS, RESTRICTIONS:** Do not allow treated weeds to come into contact with the crop. Droplets, mist, foam or splatter of the herbicide solution settling on the crop may result in discoloration, stunting or destruction.

## 8.18 Sunflowers

**TYPES OF APPLICATIONS:** Preplant, preemergence

**USE INSTRUCTIONS:** This product may be applied before, during or after planting sunflowers. Applications must be made prior to emergence of the crop.

**PRECAUTIONS, RESTRICTIONS:** Do not apply more than 1 quart of this product per acre for sunflowers. Make only one preplant or preemergent application per year. Do not feed or graze sunflower forage following application of this product.

## 8.19 Tree and Vine Crops (General)

**TYPES OF APPLICATIONS:** General weed control, middles (between rows of trees), strips (in row of trees), selective equipment (except kiwi), perennial grass suppression

**NOTE:** THIS SECTION GIVES GENERAL DIRECTIONS THAT APPLY TO ALL CITRUS CROPS, TREE FRUITS, TREE NUTS AND VINE CROPS. SEE THE INDIVIDUAL CROP SECTIONS FOR INSTRUCTIONS, PREHARVEST INTERVALS, PRECAUTIONS AND RESTRICTIONS FOR SPECIFIC CROPS.

This product may be applied in middles, strips and for general weed control in established citrus groves, tree fruit and tree nut orchards, and vineyards. Apply at 1 pint to 5 quarts per acre. Repeat applications may be made up to a maximum of 10.6 quarts per acre per year. This product may also be used for site preparation prior to transplanting these crops. Allow a minimum of 3 days between application and transplanting. Applications may be made with boom equipment, CDA, shielded sprayers, hand-held and high-volume wands, lances, orchard guns or with wiper applicator equipment, except as directed.

#### Middles (between rows)

**USE INSTRUCTIONS:** This product will control or suppress annual and perennial weeds and ground covers growing

between the rows of labeled tree and vine crops. If weeds are under drought stress, irrigate prior to application. Reduced control may result if weeds have been mowed prior to application.

A tank mixture of this product plus Goal 2XL may be used for annual weeds in middles between rows of citrus crops, tree fruits, tree nuts and vine crops. This mixture is recommended when weeds are stressed or growing in dense populations. 16 to 32 oz/A of this product plus 3 to 12 oz/A of Goal 2XL will control annual weeds with a maximum height or diameter of 6 inches, including crabgrass, hairy fleabane (*Coryza baranensis*), common groundsel, jungleweed, common lambsquarters, redroot pigweed, London rocket, common ryegrass, shepherd's-purse, annual sowthistle, common cheeseweed (malva), filaree (suppression), horseweed/marestail (*Coryza canadensis*), stinging nettle and common purslane (suppression). 12 to 32 oz/A of this product plus 3 to 12 oz/A of Goal 2XL will control common cheeseweed (malva) with a maximum height or diameter of 3 inches.

#### Strips (in rows)

**USE INSTRUCTIONS:** This product may be applied in rows of tree or vine crops and may also be tank mixed with the following products:

|                  |                     |
|------------------|---------------------|
| DEVIRINOL™ 50 DF | PRINCEP CALIBER™ 90 |
| DIREX™ 4L        | SIMAZINE 4L         |
| GOAL 2XL         | SIMAZINE 80W        |
| KARMEX DF        | SIM-TROL™ 4L        |
| KROVAR I         | SOLICAM™ DF         |
| KROVAR II        | SURFLAN™ AS         |
| PROWL            | SURFLAN 75W         |

Do not apply these tank mixtures in Puerto Rico.

Refer to the individual product labels for specific crops, rates, geographic restrictions and precautionary statements.

Apply 1 pint to 5 quarts of this product per acre in these tank mixtures. Use rates at the higher end of the recommended rate range when weeds are stressed, growing in dense populations or are greater than 12 inches tall.

#### Perennial grass suppression

This product will suppress perennial grasses such as bahiagrass, bermudagrass, tall fescue, orchardgrass, Kentucky bluegrass, and quackgrass that are grown as ground covers in tree and vine crops.

For suppression of tall fescue, fine fescue, orchardgrass and quackgrass, apply 8 fluid ounces of this product in 10 to 20 gallons of water per acre.

For suppression of Kentucky bluegrass covers, apply 6 fluid ounces of this product per acre. Do not add ammonium sulfate.

For best results, mow cool season grass covers in the spring to even their height and apply this product 3 to 4 days after mowing.

For suppression of vegetative growth and seedhead inhibition of bahiagrass for approximately 45 days, apply 6 fluid ounces of this product in 10 to 25 gallons of water per acre. Apply 1 to 2 weeks after full green-up or after mowing to a uniform height of 3 to 4 inches. This application must be made prior to seedhead emergence.

For suppression up to 120 days, apply 4 fluid ounces of this product per acre, followed by an application of 2 to 4 fluid ounces per acre about 45 days later. Make no more than 2 applications per year.

For burndown of bermudagrass, apply 1 to 2 quarts of this product in 3 to 20 gallons of water per acre. Use this treatment only if reduction of the bermudagrass stand can be tolerated. When burndown is required prior to harvest, allow at least 21 days to ensure sufficient time for burndown to occur.

For suppression of bermudagrass, apply 6 to 16 fluid ounces of this product per acre east of the Rocky Mountains and 16 fluid ounces of this product per acre west of the Rocky Mountains. Apply in a total spray volume of 3 to 20 gallons per acre, no sooner than 1 to 2 weeks after full green-up. If the bermudagrass is mowed prior to application, maintain a minimum of 3 inches in height. Sequential applications may be made when regrowth occurs and bermudagrass injury and stand reduction can be tolerated. East of the Rocky Mountains, rates of 6 to 10 fluid ounces per acre should be used in shaded conditions or where a lesser degree of suppression is desired.

#### Selective equipment

Shielded and wiper applicators may be used in tree crops and grapes. Refer to the individual crop sections for time interval between application and harvest.

**GENERAL PRECAUTIONS/RESTRICTIONS:** For all uses in this section.

**EXTREME CARE MUST BE EXERCISED TO AVOID CONTACT OF HERBICIDE SOLUTION, SPRAY, DRIFT OR MIST WITH FOLIAGE OR GREEN BARK OF TRUNK, BRANCHES, SUCKERS, FRUIT OR OTHER PARTS OF TREES AND VINES. CONTACT OF THIS PRODUCT WITH OTHER THAN MATURED BROWN BARK CAN RESULT IN SERIOUS CROP DAMAGE.**

**AVOID PAINTING CUT STUMPS WITH THIS PRODUCT AS INJURY RESULTING FROM ROOT GRAFTING MAY OCCUR IN ADJACENT TREES.**

### 8.20 Tree Fruits

**LABELED CROPS:** Apple, Apricot, Cherry (Sweet, Sour), Crabapple, Loquat, Mayhaw, Nectarine, Olive, Peach, Pear, Plum/Prune (All), Quince

**TYPES OF APPLICATIONS:** General weed control, middles (between rows of trees), strips (in row of trees), selective equipment

**NOTE: FOR GENERAL USE DIRECTIONS, SEE THE "TREE, NUT AND VINE (GENERAL)" SECTION. THE FOLLOWING DIRECTIONS ARE SPECIFIC TO TREE FRUITS.**

#### Restrictions on application equipment

For cherries, any application equipment listed in this section may be used in all states.

For citron and olives, apply as a post-directed spray only.

Any application equipment listed in this section may be used in apricots, nectarines, peaches and plums/prunes growing in Arizona, California, Colorado, Idaho, Kansas, Kentucky, New Jersey, North Dakota, Oklahoma, Oregon, Texas, Utah and Washington, except for peaches grown in the states specified in the following paragraph. In all other states use wiper equipment only.

For PEACHES grown in Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina and Tennessee only, apply with a shielded boom sprayer or shielded wiper applicator, which prevents any contact of this product with the foliage or bark of trees. Apply no later than 30 days after first bloom. Applications made after this time may result in severe damage. Remove suckers and low-hanging limbs at least 10 days prior to application. Avoid applications near trees with recent pruning wounds or other mechanical injury. Apply only near trees which have been planted in the orchard for 2 or more years. **EXTREME CARE MUST BE TAKEN TO ENSURE NO PART OF THE PEACH TREE IS CONTACTED.**

**PRECAUTIONS, RESTRICTIONS:** Allow a minimum of 1 day between last application and harvest for apple, crabapple, loquat, mayhaw, pear, quince.

Allow a minimum of 17 days between last application and harvest for apricot, cherry, nectarine, olive, peach, plum/prune.

### 8.21 Tree Nuts

**LABELED CROPS:** Almond, Beechnut, Brazil nut, Butternut, Cashew, Chestnut, Chinquapin, Filbert (Hazelnut), Hickory nut, Macadamia, Pecan, Pistachio, Walnut (Black, English)

**TYPES OF APPLICATIONS:** General weed control, middles (between rows of trees), strips (in row of trees), selective equipment

**NOTE: FOR GENERAL USE DIRECTIONS, SEE THE "TREE, NUT AND VINE (GENERAL)" SECTION. THE FOLLOWING DIRECTIONS ARE SPECIFIC TO TREE NUTS.**

**PRECAUTIONS, RESTRICTIONS:** Allow a minimum of 3 days between last application and harvest of tree nuts.

### 8.22 Tropical Crops

**LABELED CROPS:** Atemoya, Avocado, Banana, Barbados Cherry (acerola), Breadfruit, Canistel, Carambola, Cherimoya, Cocoa beans, Coconuts, Coffee, Dates, Figs, Guava, Jaboticaba, Jackfruit, Longan, Lychee, Mango, Marmaladebox (genip), Papaya, Passion fruit, Persimmon, Pineapple, Plantain, Pomegranate, Sapodilla, Sapote (black, mamey, white), Sourpaw, Sugar apple, Tamarind, Tea.

**USE INSTRUCTIONS:** This product may be applied for general weed control or for site preparation prior to transplanting crops listed in this section. In coffee and banana, delay applications 3 months after transplanting to allow the new coffee or banana plant to become established.

**PRECAUTIONS/RESTRICTIONS:** Allow a minimum of 14 days between last application and harvest of acerola, atemoya, avocado, breadfruit, canistel, carambola, cherimoya, cocoa beans, coconuts, dates, figs, genip, jaboticaba, jackfruit, longan, lychee, mango, mayhaw, passion fruit, persimmon, pomegranate, sapodilla, sapote, sourpaw, sugar apple, tamarind, and tea.

Allow a minimum of 28 days between last application and harvest of plantain and coffee.

Allow a minimum of 1 day between last application and harvest of banana, guava and papaya.

Do not feed or graze treated pineapple forage following application.

### 8.23 Vegetable Crops

**LABELED CROPS:** Amaranth, Arugula, Artichoke (Jerusalem), Beans (All), Beet greens, Garden Beets, Broccoli (All), Brussels sprouts, Cabbage (All), Cabbage (Chinese), Cantaloupe, Cardoon, Cavalo Broccoli, Carrot, Cauliflower, Casaba melon, Celery, Celery (Chinese), Celeriac, Celtuce, Chard (Swiss), Chayote, Chervil, Chick peas, Chicory, Chrysanthemum, Collards, Corn salad, Crenshaw melon, Cress, Cucumber, Dandelion, Dock (sorrel), Eggplant, Endive, Fennel (Florence), Garlic, Gherkin, Ginseng, Gourds, Ground cherry, Guar, Honeydew melon, Honey ball melon, Horseradish, Kale, Kohlrabi, Leek, Lentils, Lettuce, Mango melon, Melons (All), Mizuna, Muskmelon, Mustard greens, Okra, Onion, Oriental radish, Parsley, Parsnips, Peas (All), Pepinos, Pepper (All), Persian melon, Potato (Irish), Pumpkin, Purslane, Radish, Rape greens, Rhubarb, Rutabaga, Salsify, Shalot, Spinach (All), Mustard Spinach, Squash (Summer, Winter), Sugar beets, Sweet potato, Tomahilo, Tomato, Turnip, Watercress, Watermelon, Yams.

**USE INSTRUCTIONS:** This product may be applied prior to the emergence of direct seeded vegetables or prior to transplanting vegetables.

**PRECAUTIONS, RESTRICTIONS:** When applying this product prior to transplanting crops into plastic mulch, care must be taken to remove residues of this product from the plastic prior to transplanting. Residues can be removed by 0.5 inch natural rainfall or by applying water via a sprinkler system.

For the following crops, apply only prior to planting. Allow at least 3 days between application and planting of cantaloupe, casaba melon, crenshaw melon, cucumber, eggplant, garlic, gherkin, gourds, ground cherry, honeydew melon, honey ball melon, mango melon, melons (all), muskmelon, pepper (all), persian melon, pumpkin, squash (summer, winter), tomahilo, tomato, watercress, and watermelon.

Wiper applicators may be used in rutabagas. Allow at least 14 days between application and harvest.

### 8.24 Vine Crops

**LABELED CROPS:** Grapes (raisin, table, wine), Kiwi fruit

**TYPES OF APPLICATIONS:** General weed control, middles (between rows), strips (in row), selective equipment

**NOTE: FOR GENERAL USE DIRECTIONS, SEE THE "TREE, NUT AND VINE (GENERAL)" SECTION. THE FOLLOWING DIRECTIONS ARE SPECIFIC TO VINE CROPS.**

Applications should not be made when green shoots, canes or foliage are in the spray zone.

In the northeast and Great Lakes regions, applications must be made prior to the end of bloom stage of grapes to avoid injury, or make applications with shielded sprayers or wiper equipment.

**PRECAUTIONS, RESTRICTIONS:** Allow a minimum of 14 days between last application and harvest.

## 9.0 FARMSTEADS

**TYPES OF APPLICATIONS:** General nonselective weed control, trim-and-edge, chemical mowing, cut stumps, habitat management

## 9.1 General nonselective weed control, Trim-and-edge

**USE INSTRUCTIONS:** This product may be used to control annual weeds, perennial weeds and woody brush which are found in any part of the farmstead, including building foundations, along and in fences, in dry ditches and canals, along ditchbanks, farm roads, shelterbelts, prior to landscape plantings and equipment storage areas.

This product may be tank mixed with the following products. Refer to these product labels for approved farmstead sites and application rates. For annual weeds, use 1 quart per acre of this product when weeds are less than 6 inches tall and 1.5 quarts per acre when weeds are greater than 6 inches tall. For perennial weeds, apply 2 to 5 quarts per acre in these tank mixes. For tank mixtures with these products through backpack sprayers, handguns or other high-volume spray-to-wet applications, see the "HAND-HELD AND HIGH VOLUME EQUIPMENT" section of this label for recommended rates.

|                    |              |
|--------------------|--------------|
| Barvel             | Simazine 80W |
| Diuron             | Surflan 75W  |
| Princep Caliber 90 | Surflan AS   |
| Simazine           | 2,4-D        |
| Simazine 4L        |              |

Barvel and 2,4-D mixtures may not be applied by air in California.

## 9.2 Chemical mowing

**USE INSTRUCTIONS:** This product will suppress perennial grasses listed in this section to serve as a substitute for mowing. Apply this product at a rate of 6 to 8 fluid ounces per acre. Use 8 fluid ounces of this product per acre when treating tall fescue, fine fescue, orchardgrass or quackgrass covers. Use 6 fluid ounces of this product per acre when treating Kentucky bluegrass. Apply treatments in 10 to 20 gallons of spray solution per acre. Chemical mowing applications may be made along farm ditches and other parts of farmsteads.

**PRECAUTIONS, RESTRICTIONS:** Use only in areas where some temporary injury or discoloration of perennial grasses can be tolerated.

## 9.3 Cut Stumps

**TYPES OF APPLICATION:** Treating cut stumps in any non-crop site listed on this label

**USE INSTRUCTIONS:** This product will control regrowth of cut stumps and resprouts of many types of woody brush and tree species, some of which are listed below. Apply this product using suitable equipment to ensure coverage of the entire cambium. Cut trees or resprouts close to the soil surface. Apply a 50 to 100 percent solution of this product to the freshly-cut surface immediately after cutting. Delays in application may result in reduced performance. For best results, applications should be made during periods of active growth and full leaf expansion.

|            |            |
|------------|------------|
| Alder      | Salt cedar |
| Eucalyptus | Sweetgum   |
| Madrone    | Tan oak    |
| Oak        | Willow     |
| Red, giant |            |

**PRECAUTIONS, RESTRICTIONS:** DO NOT MAKE CUT STUMP APPLICATIONS WHEN THE ROOTS OF DESIRABLE WOODY BRUSH OR TREES MAY BE GRAFTED TO THE ROOTS OF THE CUT STUMP. INJURY RESULTING FROM ROOT GRAFTING MAY OCCUR IN ADJACENT WOODY BRUSH OR TREES.

## 9.4 Habitat Management

**TYPES OF USES:** Habitat restoration and maintenance, wildlife food plots

**Habitat restoration and maintenance**

**USE INSTRUCTIONS:** This product may be used to control exotic and other undesirable vegetation in habitat management areas. Applications can be made to allow recovery of native plant species, prior to planting desirable native species, and for similar broadspectrum vegetation control requirements in habitat management areas. Spot treatments can be made to selectively remove unwanted plants for habitat maintenance and enhancement. The tank mixtures listed

in this section of the label may be used for habitat restoration and maintenance.

**Wildlife food plots**

**USE INSTRUCTIONS:** This product may be used as a site preparation treatment to control annual and perennial weeds prior to planting wildlife food plots. Any wildlife food species may be planted after applying this product, or native species may be allowed to repopulate the area. If tillage is needed to prepare a seedbed, wait 7 days after application before tillage.

## 10.0 ANNUAL WEEDS RATE TABLES Alphabetically by Species

Water carrier volumes of 3 to 10 gallons per acre for ground applications and 3 to 5 gallons per acre for aerial applications are recommended.

Apply to actively growing annual weeds.

Do not tank mix with soil residual herbicides when using these rates unless otherwise specified.

For weeds that have been mowed, grazed or cut, allow regrowth to occur prior to treatment.

For those rates less than 48 fluid ounces per acre, this product may be used up to 48 fluid ounces per acre where heavy weed densities exist.

Refer to this map for location of the regions listed in the annual weed tables below.



ANNUAL WEEDS RATE TABLE,  
NORTH AND SOUTH REGIONS

| Weed Species             | Region | Rate<br>(Fluid Ounces Per Acre) |     |     |     |     |     |                       |
|--------------------------|--------|---------------------------------|-----|-----|-----|-----|-----|-----------------------|
|                          |        | 12                              | 16  | 24  | 32  | 40  | 48  | Maximum Height/Length |
| Annoda, spurred          |        | -                               | 1"  | 2"  | 3"  | 5"  | 8"  |                       |
| Barley                   |        | -                               | 18" | 18" | -   | -   | -   |                       |
| Barnyardgrass            | South  | -                               | 3"  | 5"  | 7"  | 9"  | 12" |                       |
|                          | North  | -                               | -   | 6"  | 12" | -   | -   |                       |
| Bittercress              |        | -                               | 12" | 20" | -   | -   | -   |                       |
| Bluegrass, annual        |        | -                               | 10" | -   | -   | -   | -   |                       |
| Brassica, fennel         |        | -                               | -   | -   | 6"  | -   | -   |                       |
| Brome, downy             |        | -                               | 6"  | -   | -   | -   | -   |                       |
| Brome, Japanese          |        | -                               | 5"  | -   | 24" | -   | -   |                       |
| Browntop panicum         |        | -                               | 6"  | 8"  | 12" | -   | 24" |                       |
| Burcucumber              |        | -                               | -   | 6"  | 12" | -   | -   |                       |
| Buttercup                |        | -                               | 12" | 20" | -   | -   | -   |                       |
| Carolina foxtail         |        | -                               | 20" | -   | -   | -   | -   |                       |
| Carolina perennium       |        | -                               | -   | -   | 4"  | -   | 9"  |                       |
| Carpetweed               |        | -                               | -   | 6"  | 12" | -   | -   |                       |
| Cheat                    |        | -                               | 5"  | 20" | -   | -   | -   |                       |
| Chenille                 |        | -                               | 20" | -   | -   | -   | -   |                       |
| Chickweed                |        | -                               | 12" | 18" | -   | -   | -   |                       |
| Cocklebur                |        | -                               | 12" | 18" | 24" | -   | -   |                       |
| Copperleaf, hopbush      |        | -                               | 1"  | 2"  | 3"  | 4"  | 6"  |                       |
| Copperleaf, Virginia     |        | -                               | 1"  | 2"  | 3"  | 4"  | 5"  |                       |
| Corn                     |        | -                               | 12" | 20" | -   | -   | -   |                       |
| Corn speedwell           |        | -                               | 12" | -   | -   | -   | -   |                       |
| Crabgrass                |        | -                               | 12" | 16" | -   | -   | -   |                       |
| Curtail evening primrose |        | -                               | -   | -   | 3"  | -   | 6"  |                       |
| Dandelion                |        | -                               | 20" | -   | -   | -   | -   |                       |
| Eastern manna grass      |        | -                               | 8"  | 12" | -   | -   | -   |                       |
| Eclipta                  |        | -                               | 4"  | 8"  | 12" | -   | -   |                       |
| Fall panicum             | South  | -                               | 4"  | 6"  | 8"  | 12" | 24" |                       |
|                          | North  | -                               | 6"  | 12" | 16" | -   | -   |                       |

# ANNUAL WEEDS RATE TABLE, NORTH AND SOUTH REGIONS

| Weed Species                                    | Region | Rate<br>(Fluid Ounces Per Acre) |         |     |     |         |
|---|--------|---------------------------------|---------|-----|-----|---------|
|   |        | 12                              | 16      | 24  | 32  | 40 48   |
|   |        | Maximum Height/Length           |         |     |     |         |
| Falsedandelion                                  |        | -                               | 20"     | -   | -   | -       |
| Falselax, smallseed                             |        | -                               | 12"     | -   | -   | -       |
| Fiddleneck                                      |        | -                               | -       | 6"  | -   | 12"     |
| Field pennycress                                |        | -                               | 6"      | 12" | -   | -       |
| Flaree  |        | -                               | -       | -   | -   | 12"     |
| Flabane, annual                                 |        | -                               | 6"      | 20" | -   | -       |
| Flabane, hairy<br>( <i>Coryza bonariensis</i> ) |        | -                               | 6"      | -   | -   | -       |
| Flabane, rough                                  |        | -                               | 3"      | 5"  | 12" | -       |
| Florida pusley                                  |        | -                               | -       | -   | 12" | -       |
| foxtail   | South  | -                               | 8"      | 12" | 20" | -       |
|   | North  | -                               | 18"     | 18" | -   | -       |
| Goatgrass, jointed                              |        | -                               | 5"      | -   | -   | -       |
| Goosegrass                                      |        | -                               | 3"      | 5"  | 8"  | 18"     |
| Grain sorghum (milo)                            |        | -                               | 5"      | 12" | 20" | -       |
| Groundsel, common                               |        | -                               | 6"      | -   | -   | -       |
| Hemp sesbania                                   |        | -                               | -       | 2"  | 4"  | 6" 8"   |
| Henbit  |        | -                               | -       | -   | 6"  | 20"     |
| Horseweed/<br>Marestail                         | South  | -                               | -       | 12" | 30" | -       |
| ( <i>Coryza</i><br><i>canadensis</i> )          | North  | -                               | 6"      | 12" | 18" | -       |
| Hitchgrass                                      |        | -                               | 5"      | 12" | 18" | -       |
| Jimsonweed                                      |        | -                               | -       | -   | 6"  | 12"     |
| Johnsongrass,<br>seedling                       | South  | -                               | -       | 18" | -   | -       |
|   | North  | -                               | 12"     | 18" | -   | -       |
| Junglerice                                      |        | -                               | 3"      | 5"  | 7"  | 5" 12"  |
| Knotted   |        | -                               | 3"      | 8"  | 12" | 20"     |
| Kochia <sup>1</sup>                             |        | -                               | 3 to 6" | 12" | -   | -       |
| Lambsquarters                                   |        | -                               | 5"      | 8"  | 12" | 20"     |
| Little barley                                   |        | -                               | 20"     | -   | -   | -       |
| London rocket                                   |        | -                               | 6"      | -   | -   | -       |
| Mayweed   |        | -                               | -       | 2"  | 6"  | 12" 18" |
| Morningglory ( <i>Ipomoea</i> spp.)             |        | -                               | -       | 2"  | 4"  | 5"      |
| Mustard, blue                                   |        | -                               | 6"      | -   | -   | -       |
| Mustard, tansy                                  |        | -                               | 6"      | 12" | 20" | -       |
| Mustard, tumble                                 |        | -                               | 6"      | -   | -   | -       |
| Mustard, wild                                   |        | -                               | 6"      | 12" | 18" | -       |
| Nightshade, black                               |        | -                               | 5"      | 12" | -   | -       |
| Nightshade, hairy                               |        | -                               | 6"      | 12" | -   | -       |
| Oats  |        | -                               | -       | 6"  | 20" | -       |
| Pigweed   |        | -                               | 12"     | 18" | 24" | -       |
| Plains/Tickseed<br>coreopsis                    |        | -                               | 5"      | 12" | 18" | -       |
| Prickly lettuce                                 |        | -                               | 6"      | 12" | 20" | -       |
| Purslane  |        | -                               | -       | -   | 6"  | 12"     |
| Ragweed, common                                 | South  | -                               | 4"      | 6"  | 8"  | 11"     |
|   | North  | -                               | 6"      | 12" | 18" | -       |
| Ragweed, giant                                  |        | -                               | -       | 4"  | 6"  | 11"     |
| Red rice  |        | -                               | -       | -   | 4"  | -       |
| Russian thistle                                 |        | -                               | -       | -   | 6"  | -       |
| Rye   | South  | -                               | 6"      | 20" | 60" | -       |
|   | North  | -                               | -       | 18" | 18" | -       |
| Ryegrass  |        | -                               | -       | -   | 6"  | 7"      |
| Sandbur, field                                  |        | 12"                             | -       | -   | -   | -       |
| Shattercane                                     |        | -                               | 12"     | 18" | -   | -       |
| Shepherd's-purse                                |        | -                               | 6"      | 12" | -   | -       |
| Sicklepod                                       |        | -                               | -       | 2"  | 4"  | 8"      |
| Signalgrass, broadleaf                          |        | -                               | 3"      | 5"  | 7"  | 9" 12"  |
| Smartweed, lachystumb                           |        | -                               | 4"      | 6"  | 8"  | 12"     |
| Smartweed, Pennsylvania                         |        | -                               | 4"      | 6"  | 8"  | 12"     |
| Sowthistle, annual                              |        | -                               | -       | -   | 6"  | 12"     |
| Spanghneedles                                   |        | -                               | -       | -   | 8"  | 18"     |
| Speedwell, purslane                             |        | -                               | 12"     | -   | -   | -       |
| Sprangletop                                     |        | -                               | 8"      | 12" | 20" | -       |
| Spurge, prostrate                               |        | -                               | 6"      | 12" | 20" | -       |
| Spurge, spotted                                 |        | -                               | 6"      | 12" | 20" | -       |
| Soury, umbrella                                 |        | -                               | 8"      | -   | -   | -       |
| Shikgrass                                       |        | 12"                             | -       | -   | -   | -       |
| Sunflower                                       |        | -                               | 12"     | 18" | -   | -       |
| Tanweed/ Pricky sida                            |        | -                               | 1"      | 2"  | 3"  | 4" 6"   |
| Texas panicum                                   |        | -                               | 5"      | 8"  | 12" | 24"     |

|                       |       |   |     |     |     |    |    |
|-----------------------|-------|---|-----|-----|-----|----|----|
| Velvetleaf            | South | - | 2"  | 3"  | 4"  | 5" | 8" |
|                       | North | - | 3"  | 6"  | 12" | -  | -  |
| Virginia pepperweed   |       | - | 18" | -   | -   | -  | -  |
| Waterhemp             |       | - | -   | 6"  | 12" | -  | -  |
| Wheat                 | South | - | 5"  | 30" | -   | -  | -  |
|                       | North | - | 18" | 18" | -   | -  | -  |
| Wheat, (overwintered) |       | - | 6"  | 18" | -   | -  | -  |
| Wild oats             |       | - | 12" | -   | -   | -  | -  |
| Witchgrass            |       | - | 12" | -   | -   | -  | -  |
| Woolly cupgrass       |       | - | 6"  | 12" | -   | -  | -  |
| Yellow rocket         |       | - | -   | 12" | 20" | -  | -  |

<sup>1</sup> Do not treat kochia in the button stage.

## ANNUAL WEEDS RATE TABLE, WEST REGION

| Weed Species  | Rate<br>(Fluid Ounces Per Acre) |                           |    |     |     |
|---|---------------------------------|---------------------------|----|-----|-----|
|   | 12                              | 16                        | 24 | 32  | 48  |
|   | Maximum Height/Length           |                           |    |     |     |
| Barley  | 12"                             | -                         | -  | -   | -   |
| Barley/ridgrass                                     | 6"                              | -                         | -  | -   | -   |
| Bluegrass, annual                                   | -                               | -                         | -  | -   | -   |
| Bluegrass, bulbous                                  | -                               | 6"                        | -  | -   | -   |
| Brome, downy <sup>1</sup>                           | 6"                              | -                         | -  | -   | -   |
| Buttercup   | -                               | 12"                       | -  | -   | -   |
| Cheat   | -                               | 6"                        | -  | -   | -   |
| Chickweed   | -                               | 6"                        | -  | -   | -   |
| Cocklebur   | -                               | 12"                       | -  | -   | -   |
| Corn  | -                               | 6"                        | -  | -   | -   |
| Crabgrass   | -                               | 12"                       | -  | -   | -   |
| Dwarf/dandelion                                     | -                               | 12"                       | -  | -   | -   |
| Fall panicum  | -                               | 12"                       | -  | -   | -   |
| Falselax, smallseed                                 | -                               | 12"                       | -  | -   | -   |
| Field pennycress                                    | -                               | 6"                        | -  | -   | -   |
| Flaree  | -                               | -                         | -  | -   | 12" |
| Flabane, hairy<br>( <i>Coryza bonariensis</i> )     | -                               | 6"                        | -  | -   | -   |
| Florida pusley                                      | -                               | -                         | -  | 12" | -   |
| foxtail   | -                               | (8 fl. oz. for up to 12") | -  | -   | -   |
| Goatgrass, jointed                                  | -                               | 6"                        | -  | -   | -   |
| Groundsel, common                                   | -                               | 6"                        | -  | -   | -   |
| Henbit  | -                               | 5"                        | -  | -   | -   |
| Horseweed/Marestail<br>( <i>Coryza canadensis</i> ) | -                               | 5"                        | -  | -   | -   |
| Johnsongrass, seedling                              | -                               | 12"                       | -  | -   | -   |
| Lambsquarters                                       | -                               | 5"                        | -  | -   | -   |
| London rocket                                       | -                               | 5"                        | -  | -   | -   |
| Morningglory ( <i>Ipomoea</i> spp.)                 | -                               | 2"                        | -  | -   | -   |
| Mustard, blue                                       | -                               | 5"                        | -  | -   | -   |
| Mustard, tansy                                      | -                               | 6"                        | -  | -   | -   |
| Mustard, tumble                                     | -                               | 6"                        | -  | -   | -   |
| Mustard, wild                                       | -                               | 6"                        | -  | -   | -   |
| Pigweed   | -                               | 12"                       | -  | -   | -   |
| Rye   | 12"                             | -                         | -  | -   | -   |
| Ryegrass, Italian                                   | -                               | 6"                        | -  | -   | -   |
| Sandbur, field                                      | 12"                             | -                         | -  | -   | -   |
| Shattercane   | 12"                             | -                         | -  | -   | -   |
| Shepherd's-purse                                    | -                               | 6"                        | -  | -   | -   |
| Sowthistle, annual                                  | -                               | 6"                        | -  | -   | -   |
| Spurge, annual                                      | -                               | 6"                        | -  | -   | -   |
| Stinkgrass  | 12"                             | -                         | -  | -   | -   |
| Texas panicum                                       | -                               | 12"                       | -  | -   | -   |
| Wheat   | 18"                             | -                         | -  | -   | -   |
| Wild oats   | -                               | 12"                       | -  | -   | -   |
| Witchgrass  | -                               | 12"                       | -  | -   | -   |

<sup>1</sup> For control of Downy brome in no-till systems, use 16 fluid ounces per acre.

## 10.1 Annual Weeds—Water Carrier Volumes of 10 to 40 Gallons Per Acre

Apply 1 to 1.5 quarts of this product per acre. Use 1 quart per acre if weeds are less than 6 inches tall and 1.5 quarts per acre if weeds are over 6 inches tall.

These rates will provide control of weeds listed in the annual weed control tables when water carrier volumes are 10 to 40 gallons per acre for ground applications.

## 10.2 Annual Weeds—Tank Mixtures with 2,4-D or Banvel

12 to 16 fluid ounces of this product plus 0.25 pound a.i. of Banvel or 0.5 pound a.i. of 2,4-D per acre will control the following weeds with the maximum height or length indicated: 6" — prickly lettuce, mare's tail/morseweed (*Coryza canadensis*), morningglory (*Ipomoea* spp.), kochia (Banvel only); 12" — cocklebur, lamb's quarters, pigweed, Russian thistle.

16 fluid ounces of this product plus 0.5 pound a.i. of 2,4-D per acre will control the following weeds when they are a maximum height or length of 6 inches: common ragweed, giant ragweed, Pennsylvania smartweed, and velvetleaf.

12 fluid ounces of this product plus 0.25 pound a.i. of Banvel or 0.5 pound a.i. of 2,4-D per acre will control foxtail up to 18".

Refer to the specific product labels for crop rotation restrictions and cautionary statements of all products used in tank mixtures. Some crop injury may occur if Banvel is applied within 45 days of planting.

DO NOT APPLY BANVEL OR 2,4-D TANK MIXTURES BY AIR IN CALIFORNIA.

## 11.0 PERENNIAL WEEDS RATE TABLE Alphabetically by Species

Apply to actively growing perennial weeds.

NOTE: If weeds have been mowed or tilled, do not treat until plants have resumed active growth and have reached the recommended stages.

Repeat treatments may be necessary to control weeds regenerating from underground parts or seed. Repeat treatments must be made prior to crop emergence.

Unless otherwise stated, allow 7 or more days after application before tillage.

Do not treat when weeds are under drought stress as good soil moisture is necessary for active growth.

For hand-held sprayers, prepare the desired volume of spray solution by mixing the amount of this product in water as shown in the following table:

### Spray Solution

| Desired Volume | 1%       | 1 1/2%    | 2%       | 5%       | 10%    |
|----------------|----------|-----------|----------|----------|--------|
| 1 Gal 4 fl oz  | 1 1/4 oz | 2 oz      | 2 1/2 oz | 6 1/4 oz | 13 oz  |
| 25 Gal 1 pt    | 1 qt     | 1 1/4 qt  | 2 qt     | 5 qt     | 10 qt  |
| 100 Gal 2 qt   | 1 gal    | 1 1/2 gal | 2 gal    | 5 gal    | 10 gal |

2 tablespoons = 1 fluid ounce

| Weed Species | Rate (QT/A) | Water Volume (GPA) | Hand-Held % Solution |
|--------------|-------------|--------------------|----------------------|
| Alfalfa      | 1           | 3-10               | 2%                   |

Make applications after the last hay cutting in the fall. Allow alfalfa to regrow to a height of 6 to 8 inches or more prior to treatment. Applications should be followed with deep tillage at least 7 days after treatment, but before soil freeze-up.

Alligatorweed 4 3-20 1.5%

Partial control. Apply when most of the plants are in bloom. Repeat applications will be required to maintain control.

Anise (fennel) — — 1-2%

Apply as a spray-to-wet treatment. Optimum results are obtained when plants are treated at the bud to full-bloom stage of growth.

Bahia grass 3-5 3-20 2%

Apply when most plants have reached the early head stage.

Bentgrass 1.5 10-20 2%

For suppression in grass seed production areas. For ground applications only. Ensure entire crown area has resumed growth prior to a full application. Bentgrass should have at least 3 inches of growth. Tillage prior to treatment should be avoided. Tillage 7 to 10 days after application is recommended for best results.

Bermudagrass 3-5 3-20 2%

For control, apply 5 quarts of this product per acre. For partial control, apply 3 quarts per acre. Treat when bermudagrass is actively growing and seedheads are present. Retreatment may be necessary to maintain control.

Bermudagrass.

water (knotgrass) 1-1.5 5-10 2%

Apply 1.5 quarts of this product in 5 to 10 gallons of water per acre. Apply when water bermudagrass is 12 to 18 inches in length. Allow 7 or more days before tilling, burning or flooding the field.

Fall applications only. Apply 1 quart of this product in 5 to 10 gallons of water per acre. Follow fields should be tilled prior to application. Apply prior to frost on water bermudagrass that is 12 to 18 inches in length.

This product is not registered in California for use on water bermudagrass.

Bindweed, field 0.5-5 3-20 2%

Do not treat when weeds are under drought stress as good soil moisture is necessary for active growth.

For control, apply 4 to 5 quarts of this product per acre west of the Mississippi River and 3 to 4 quarts east of the Mississippi River. Apply when the weeds are at or beyond full bloom. For best results, apply in late summer or fall. Fall treatments must be applied before a killing frost.

Also for control, apply 2 quarts of this product plus 0.5 pound a.i. of Banvel in 10 to 20 gallons of water per acre. Do not apply by air.

For suppression on irrigated agricultural land, apply 1 to 2 quarts of this product plus 1 pound a.i. of 2,4-D in 10 to 20 gallons of water per acre with ground equipment only. Applications should be made following harvest or in fall fallow ground when the bindweed is actively growing and the majority of runners are 12 inches or more in length. The use of at least one irrigation will promote active bindweed growth.

For suppression, apply 16 fluid ounces of this product plus 0.5 pound a.i. of 2,4-D in 3 to 10 gallons of water per acre for ground applications and 3 to 5 gallons of water per acre for aerial applications. Apply by air in fallow and reduced tillage systems only. Applications should be delayed until maximum emergence has occurred and when vines are between 6 to 18 inches in length.

In California only, apply 1 to 5 quarts of this product per acre. Actual rate needed for suppression or control will vary within this range depending on local conditions. For suppression on irrigated land where annual tillage is performed, apply 1 quart of this product in 3 to 10 gallons of water per acre. Apply to bindweed that has reached a length of 12 inches or greater. Allow maximum weed emergence and runner growth. Allow 3 or more days after application before tillage.

Bluegrass, Kentucky 1-2 3-40 2%

Apply 2 quarts of this product in 10 to 40 gallons of water per acre when most plants have reached boot-to-early seedhead stage of development. For partial control in pasture or hay crop renovation, apply 1 to 1.5 quarts of this product in 3 to 10 gallons of water per acre. Apply to actively growing plants when most have reached 4 to 12 inches in height.

Blueweed, Texas 3-5 3-40 2%

Apply 4 to 5 quarts of this product per acre west of the Mississippi River and 3 to 4 quarts per acre east of the Mississippi River. Apply when plants are at or beyond full bloom. New leaf development indicates active growth. For best results, apply in late summer or fall. Fall treatments must be applied before a killing frost.

Brackenfern 3-4 3-40 1-1.5%

Apply to fully expanded fronds which are at least 18 inches long.

Bromegrass, smooth 1-2 3-40 2%

Apply 2 quarts of this product in 10 to 40 gallons of water per acre when most plants have reached boot-to-early seedhead stage of development. For partial control in pasture or hay crop renovation, apply 1 to 1.5 quarts of this product in 3 to 10 gallons of water per acre. Apply to actively growing plants when most have reached 4 to 12 inches in height.

Burnsage, woolly-leaf — 3-20 2%

For control, apply 2 quarts of this product plus 1 pint of Banvel per acre. For partial control, apply 1 quart of this product plus 1 pint of Banvel per acre. Apply when plants are producing new active growth which has been initiated by moisture for at least 2 weeks and when plants are at or beyond flowering.

Canebrakegrass, reed 2-3 3-40 2%

For best results, apply when most plants have reached the boot-to-head stage of growth.

Cattail 3-5 3-40 2%

Apply when most plants have reached the early head stage.

Clover, red, white 3-5 3-20 2%

Apply when most plants have reached the early bud stage.

Cogongrass 3-5 10-40 2%

Apply when cogongrass is at least 18 inches tall in late summer or fall. Due to uneven stages of growth and the dense nature of vegetation preventing good spray coverage, repeat treatments may be necessary to maintain control.

| Weed Species   | Rate (QT/A) | Water Volume (GPA) | Hand-Held % Solution |
|--|-------------|--------------------|----------------------|
| Dallisgrass  | 3-5         | 3-20               | 2%                   |
| Apply when most plants have reached the early bud stage.   |             |                    |                      |
| Dandelion  | 3-5         | 3-40               | 2%                   |
| Apply when most plants have reached the early bud stage of growth.   |             |                    |                      |
| Also for control, apply 16 fluid ounces of this product plus 0.5 pound a.i. 2,4-D in 3 to 10 gallons of water per acre.  |             |                    |                      |
| Dock, curly  | 3-5         | 3-40               | 2%                   |
| Apply when most plants have reached the early bud stage of growth.   |             |                    |                      |
| Also for control, apply 16 fluid ounces of this product plus 0.5 pound a.i. 2,4-D in 3 to 10 gallons of water per acre.  |             |                    |                      |
| Dogbane, hemp  | 4           | 3-40               | 2%                   |
| Apply when most plants have reached the late bud to flower stage of growth. Following crop harvest or mowing, allow weeds to regrow to a mature stage prior to treatment. For best results, apply in late summer or fall.  |             |                    |                      |
| For suppression, apply 16 fluid ounces of this product plus 0.5 pound a.i. 2,4-D in 3 to 10 gallons of water per acre for ground applications and 3 to 5 gallons of water per acre for aerial applications. Delay applications until maximum emergence of dogbane has occurred.  |             |                    |                      |
| Fescue (except tall)   | 3-5         | 3-20               | 2%                   |
| Apply when most plants have reached the early head stage.  |             |                    |                      |
| Fescue, tall   | 1-3         | 3-40               | 2%                   |
| Apply 3 quarts of this product per acre when most plants have reached boot-to-early seedhead stage of development.   |             |                    |                      |
| Fall applications only: Apply 1 quart of this product in 3 to 10 gallons of water per acre. Apply to fescue in the fall when plants have 8 to 12 inches of new growth. A sequential application of 1 quart per acre of this product will improve long-term control and control seedlings germinating after fall treatments or the following spring.                        |             |                    |                      |
| Guineagrass  | 3           | 3-40               | 1%                   |
| Apply when most plants have reached at least the 7-leaf stage of growth. Ensure thorough coverage when using hand-held equipment.  |             |                    |                      |
| Horseweed  | 3-5         | 3-20               | 2%                   |
| Apply when most plants have reached the early bud stage.   |             |                    |                      |
| Horse radish   | 4           | 3-40               | 2%                   |
| Apply when most plants have reached the late bud to flower stage of growth. For best results, apply in late summer or fall.  |             |                    |                      |
| Isopent  | —           | —                  | 1.5-2%               |
| Isopent should be at or beyond the early bud stage of growth. Thorough coverage is necessary for best control.   |             |                    |                      |
| Jerusalem artichoke  | 3-5         | 3-20               | 2%                   |
| Apply when most plants are in the early bud stage.   |             |                    |                      |
| Johnsongrass   | 0.5-3       | 3-40               | 1%                   |
| In annual cropping systems apply 1 to 2 quarts of this product per acre. Apply 1 quart of this product in 3 to 10 gallons of water per acre. Use 2 quarts of this product when applying 10 to 40 gallons of water per acre. In noncrop, or areas where annual blage (no-till) is not practiced, apply 2 to 3 quarts of this product in 10 to 40 gallons of water per acre. |             |                    |                      |
| For best results, apply when most plants have reached the boot-to-head stage of growth or in the fall prior to frost. Allow 7 or more days after application before tillage. Do not tank-mix with residual herbicides when using the 1 quart per acre rate.  |             |                    |                      |
| For burn-down of Johnsongrass, apply 1 pint of this product in 3 to 10 gallons of water per acre before the plants reach a height of 12 inches. For this use, allow at least 3 days after treatment before tillage.  |             |                    |                      |
| Spot treatment (partial control or suppression)—Apply a 1 percent solution of this product when Johnsongrass is 12 to 18 inches in height. Coverage should be uniform and complete.  |             |                    |                      |
| Kikuyugrass  | 2-3         | 3-40               | 2%                   |
| Spray when most kikuyugrass is at least 8 inches in height (3 or 4-leaf stage of growth). Allow 3 or more days after application before tillage.   |             |                    |                      |
| Knapweed   | 4           | 3-40               | 2%                   |
| Apply when most plants have reached the late bud to flower stage of growth. For best results, apply in late summer or fall.  |             |                    |                      |
| Lantana  | —           | —                  | 1-1.25%              |
| Apply at or beyond the bloom stage of growth. Use the higher application rate for plants that have reached the woody stage of growth.  |             |                    |                      |
| Lespedeza  | 3-5         | 3-20               | 2%                   |
| Apply when most plants have reached the early bud stage.   |             |                    |                      |
| Milkwed, common  | 3           | 3-40               | 2%                   |

Apply when most plants have reached the late bud to flower stage of growth.

Mulch, wirestem 1-2 3-40 2%

Use 1 quart of this product in 3 to 10 gallons of water per acre. Use 2 quarts of this product when applying 10 to 40 gallons of water per acre or in pasture, sod, or noncrop areas. Spray when the wirestem mulch is 8 inches or more in height. Do not till between harvest and fall applications or in the fall or spring prior to spring applications. Allow 3 or more days after application before tillage.

Mullein, common 3-5 3-20 2%

Apply when most plants are in the early bud stage.

Napiergrass 3-5 3-20 2%

Apply when most plants are in the early head stage.

Nightshade, 2 3-10 2%

suberial

Applications should be made when at least 80 percent of the plants have berries. Fall treatments must be applied before a killing frost.

Nutsedge, 0.5-3 3-40 1-2%

purple, yellow

Apply 3 quarts of this product per acre or apply a 1 to 2 percent solution for control of nutsedge plants and immature nutseds attached to treated plants. Treat when plants are in flower or when new nutseds can be found at rhizome tips. Nutseds which have not germinated will not be controlled and may germinate following treatment. Repeat treatments will be required for long-term control of ungerminated tubers.

Sequential applications: 1 to 2 quarts of this product in 3 to 10 gallons of water per acre will also provide control. Make applications when a majority of the plants are in the 3 to 5-leaf stage (less than 6 inches tall). Repeat this application, as necessary, when newly emerging plants reach the 3 to 5-leaf stage. Subsequent applications will be necessary for long-term control.

For partial control of existing plants, apply 1 pint to 2 quarts of this product in 3 to 40 gallons of water per acre. Treat when plants have 3 to 5 leaves and most are less than 6 inches tall. Repeat treatments will be required to control subsequent emerging plants or regrowth of existing plants.

Orchardgrass 1-2 3-40 2%

Apply 2 quarts of this product in 10 to 40 gallons of water per acre when most plants have reached boot-to-early seedhead stage of development.

For partial control in pasture or hay crop renovation, apply 1 to 1.5 quarts of this product in 3 to 10 gallons of water per acre. Apply to actively growing plants when most have reached 4 to 12 inches in height.

Orchardgrass sods going to no-till corn: Apply 1 to 1.5 quarts of this product in 3 to 10 gallons of water per acre. Apply to orchardgrass that is a minimum of 12 inches tall for spring applications and 6 inches tall for fall applications. Allow at least 3 days following application before planting. A sequential application of atrazine will be necessary for optimum results.

Pampasgrass — — 1.5-2%

Pampasgrass should be at or beyond the boot stage of growth.

Thorough coverage is necessary for best control.

Paragrass 3-5 3-20 2%

Apply when most plants are in the early head stage.

Phragmites 3-5 10-40 1-2%

For partial control, for best results, treat during late summer or fall months or when plants are actively growing and in full bloom. Treatment before or after this stage may lead to reduced control. Due to the dense nature of the vegetation, which may prevent good spray coverage or uneven stages of growth, repeat treatments may be necessary to maintain control. Visual control symptoms will be slow to develop.

Poison hemlock — — 1-2%

Apply as a spray-to-wet treatment. Optimum results are obtained when plants are treated at the bud to full-bloom stage of growth.

Quackgrass 1-3 3-40 2%

In annual cropping systems, or in pastures and sods followed by deep blage: Apply 1 quart of this product in 3 to 10 gallons of water per acre. For 10 to 40 gallons of water per acre, apply 2 quarts of this product. Do not tank mix with residual herbicides when using the 1 quart rate. Spray when quackgrass is 6 to 8 inches in height. Do not till between harvest and fall applications or in fall or spring prior to spring application. Allow 3 or more days after application before tillage. In pastures or sods, use a moldboard plow for best results.

In pastures, sods or noncrop areas where deep blage does not follow application: Apply 2 to 3 quarts of this product in 10 to 40 gallons of water per acre when the quackgrass is greater than 8 inches tall.

| Weed Species | Rate (QT/A) | Water Volume (GPA) | Hand-Held % Solution |
|--------------|-------------|--------------------|----------------------|
|--------------|-------------|--------------------|----------------------|

Redvine 0.75-2 5-10 2%

For suppression, apply 24 fluid ounces of this product per acre at each of two applications 7 to 14 days apart or a single application of 2 quarts per acre. Apply recommended rates in 5 to 10 gallons of water per acre. Apply in late September or early October to plants which are at least 18 inches tall and have been growing 45 to 60 days since the last tillage operation. Make applications at least 1 week before a killing frost.

Reed, giant — — 2%

Best results are obtained when applications are made in late summer to fall.

Ryegrass, perennial 1-3 3-40 1%

In annual cropping systems apply 1 to 2 quarts of this product per acre. Apply 1 quart of this product in 3 to 10 gallons of water per acre. Use 2 quarts of this product when applying 10 to 40 gallons of water per acre. In noncrop, or areas where annual tillage (no-till) is not practiced, apply 2 to 3 quarts of this product in 10 to 40 gallons of water per acre.

For best results, apply when most plants have reached the boot-to-head stage of growth or in the fall prior to frost. Do not tank-mix with residual herbicides when using the 1 quart per acre rate.

Smartweed, swamp 3-5 3-40 2%

Apply when most plants have reached the early bud stage of growth.

Also for control, apply 16 fluid ounces of this product plus 0.5 pound a.i. of 2,4-D in 3 to 10 gallons of water per acre in the late summer or fall.

Spurge, leafy — 3-10 2%

For suppression, apply 16 fluid ounces of this product plus 0.5 pound a.i. of 2,4-D in 3 to 10 gallons of water per acre in the late summer or fall. If mowing has occurred prior to treatment, apply when most of the plants are 12 inches tall.

Starthistle, yellow 2 10-40 2%

Best results are obtained when applications are made during the rosette, bolting and early flower stages.

Sweet potato, wild — — 2%

Partial control. Apply to plants that are at or beyond the bloom stage of growth. Repeat applications may be required.

Thistle, artichoke — — 2%

Partial control. Apply to plants that are at or beyond the bloom stage of growth. Repeat applications may be required.

Thistle, Canada 2-3 3-40 2%

Apply when most plants are at or beyond the bud stage of growth. After harvest, mowing or tillage in the late summer or fall, allow at least 4 weeks for initiation of active growth and rosette development prior to the application of this product. Fall treatments must be applied before a killing frost. Allow 3 or more days after application before tillage.

For suppression, apply 1 quart of this product, or 1 pint of this product plus 0.5 pound a.i. of 2,4-D, in 3 to 10 gallons of water per acre in the late summer or fall after harvest, mowing or tillage. Allow rosette regrowth to a minimum of 6 inches in diameter before treating. Applications can be made as long as leaves are still green and plants are actively growing at the time of application. Allow 3 or more days after application before tillage.

Timothy 2-3 3-40 2%

For best results, apply when most plants have reached the boot-to-head stage of growth.

Torpedograss 4-5 3-40 2%

For partial control. Apply when most plants are at or beyond the seed-head stage of growth. Repeat applications will be required to maintain control. Fall treatments must be applied before frost.

Trumpetcreeper 2 5-10 2%

Partial control. Apply in late September or October, to plants which are at least 18 inches tall and have been growing 45 to 60 days since the last tillage operation. Make applications at least 1 week before a killing frost.

Vaseygrass 3-5 3-20 2%

Apply when most plants are in the early head stage.

Velvetgrass 3-5 3-20 2%

Apply when most plants are in the early head stage.

Wheatgrass, western 2-3 3-40 2%

For best results, apply when most plants have reached the boot-to-head stage of growth.

## 12.0 WOODY BRUSH AND TREES RATE TABLE Alphabetically by Species

Apply this product after full leaf expansion, unless otherwise directed. Use the higher rate for larger plants and/or dense areas of growth. On vines, use the higher rate for plants that have reached the woody stage of growth. Best results are obtained when application is made in late summer or fall after fruit formation.

In arid areas, best results are obtained when applications are made in the spring to early summer when brush species are at high moisture content and are flowering.

Ensure thorough coverage when using hand-held equipment. Symptoms may not appear prior to frost or senescence with fall treatments.

Allow 7 or more days after application before tillage, mowing or removal. Repeat treatments may be necessary to control plants regenerating from underground parts or seed. Some autumn colors on undesirable deciduous species are acceptable provided no major leaf drop has occurred. Reduced performance may result if fall treatments are made following a frost.

| Weed Species | Rate (QT/A) | Water Volume (GPA) | Hand-Held % Solution |
|--------------|-------------|--------------------|----------------------|
|--------------|-------------|--------------------|----------------------|

Alder 3-4 3-40 1-1.5%

For control

Ash 2-5 3-40 1-2%

Partial control

Aspen, quaking 2-3 3-40 1-1.5%

For control

Bearnut (Beardover) 2-5 3-40 1-2%

Partial control

Beech 2-5 3-40 1-2%

Partial control

Birch 2 3-40 1%

For control

Blackberry 3-4 10-40 1-1.5%

For control. Make applications after plants have reached full leaf maturity. Best results are obtained when applications are made in late summer or fall. Applications may also be made after leaf drop and until a killing frost or as long as stems are green. After berries have set or dropped in late fall, blackberry can be controlled by applying a 3/4 percent solution of this product. For control of blackberries after leaf drop and until killing frost or as long as stems are green, apply 3 to 4 quarts of this product in 10 to 40 gallons of water per acre.

Blackgum 2-5 3-40 1-2%

For control

Bracken 2-5 3-40 1-2%

For control

Broom;

French, Scotch — — 1.5-2%

For control

Buckwheat, California — — 1-2%

For partial control. Thorough coverage of foliage is necessary for best results.

Cascara 2-5 3-40 1-2%

Partial control

Catsclaw — — 1-1.5%

Partial control

Ceanothus 2-5 3-40 1-2%

Partial control

Chamise — — 1%

For control. Thorough coverage of foliage is necessary for best results.

Cherry; bitter, black, pin 2-3 3-40 1-1.5%

For control

Coyote brush — — 1.5-2%

For control. Apply when at least 50 percent of the new leaves are fully developed.

Dogwood 2-5 3-40 1-2%

Partial control



| Weed Species  | Rate (QT/A) | Water Volume (GPA) | Hand-Held % Solution |
|---|-------------|--------------------|----------------------|
| Elderberry  | 2           | 3-40               | 1%                   |
| For control   |             |                    |                      |
| Elm   | 2-5         | 3-40               | 1-2%                 |
| Partial control   |             |                    |                      |
| Eucalyptus  | —           | —                  | 2%                   |
| For control of eucalyptus resprouts, apply when resprouts are 6 to 12 feet tall. Ensure complete coverage. Avoid application to drought-stressed plants.                          |             |                    |                      |
| Florida holly (Brazilian Pepper tree)   | 2-5         | 3-40               | 1-2%                 |
| Partial control   |             |                    |                      |
| Gorse   | 2-5         | 3-40               | 1-2%                 |
| Partial control   |             |                    |                      |
| Hamamelis   | —           | —                  | 1-2%                 |
| Partial control. Thorough coverage of foliage is necessary for best results.  |             |                    |                      |
| Hawthorn  | 2-3         | 3-40               | 1-1.5%               |
| For control   |             |                    |                      |
| Hazel   | 2           | 3-40               | 1%                   |
| For control   |             |                    |                      |
| Hickory   | 2-5         | 3-40               | 1-2%                 |
| Partial control   |             |                    |                      |
| Honeysuckle   | 3-4         | 3-40               | 1-1.5%               |
| For control   |             |                    |                      |
| Hornbeam, American  | 2-5         | 3-40               | 1-2%                 |
| Partial control   |             |                    |                      |
| Kudzu   | 4           | 3-40               | 2%                   |
| For control. Repeat applications may be required to maintain control.   |             |                    |                      |
| Locust, black   | 2-4         | 3-40               | 1-2%                 |
| Partial control   |             |                    |                      |
| Madrone resprouts   | —           | —                  | 2%                   |
| Partial control. Apply to resprouts that are 3 to 6 feet tall. Best results are obtained with spring/early summer treatments.   |             |                    |                      |
| Manzanita   | 2-5         | 3-40               | 1-2%                 |
| Partial control   |             |                    |                      |
| Maple, red  | 2-4         | 3-40               | 1-1.5%               |
| For control, apply a 1 to 1.5 percent solution when at least 50 percent of the new leaves are fully developed. For partial control, apply 2 to 4 quarts of this product per acre. |             |                    |                      |
| Maple, sugar  | —           | —                  | 1-1.5%               |
| For control. Apply when at least 50 percent of the new leaves are fully developed.  |             |                    |                      |
| Monkey flower   | —           | —                  | 1-2%                 |
| Partial control. Thorough coverage of foliage is necessary for best results.  |             |                    |                      |
| Oak, black, white   | 2-4         | 3-40               | 1-2%                 |
| Partial control   |             |                    |                      |
| Oak, post   | 3-4         | 3-40               | 1-1.5%               |
| For control   |             |                    |                      |
| Oak, northern, pin  | —           | —                  | 1-1.5%               |
| For control. Apply when at least 50 percent of the new leaves are fully developed.  |             |                    |                      |
| Oak, southern red   | 2-3         | 3-40               | 1-1.5%               |
| For control   |             |                    |                      |
| Persimmon   | 2-5         | 3-40               | 1-2%                 |
| Partial control   |             |                    |                      |
| Pine  | 2-5         | 3-40               | 1-2%                 |
| For control   |             |                    |                      |
| Poison ivy/ Poison oak  | 4-5         | 3-40               | 2%                   |
| For control. Repeat applications may be required to maintain control. Fall treatments must be applied before leaves lose green color.   |             |                    |                      |
| Poplar, yellow  | 2-5         | 3-40               | 1-2%                 |
| Partial control   |             |                    |                      |
| Redbud, eastern   | 2-5         | 3-40               | 1-2%                 |
| For control   |             |                    |                      |

|  |     |      |        |
|--|-----|------|--------|
| Rose, multiflora   | 2   | 3-40 | 1%     |
| For control. Treatments should be made prior to leaf deterioration by leaf-eating insects.                                     |     |      |        |
| Russian olive  | 2-5 | 3-40 | 1-2%   |
| Partial control  |     |      |        |
| Sage, black  | —   | —    | 1%     |
| For control. Thorough coverage of foliage is necessary for best results.   |     |      |        |
| Sage, white  | 2-5 | 3-40 | 1-2%   |
| Partial control  |     |      |        |
| Sage brush, California   | —   | —    | 1%     |
| For control. Thorough coverage of foliage is necessary for best results.   |     |      |        |
| Salmonberry  | 2   | 3-40 | 1%     |
| For control  |     |      |        |
| Sail-cedar   | 2-5 | 3-40 | 1-2%   |
| For control  |     |      |        |
| Sassafras  | 2-5 | 3-40 | 1-2%   |
| Partial control  |     |      |        |
| Sourwood   | 2-5 | 3-40 | 1-2%   |
| Partial control  |     |      |        |
| Sumac, poison, smooth, winged  | 2-4 | 3-40 | 1-2%   |
| Partial control  |     |      |        |
| Sweetgum   | 2-3 | 3-40 | 1-1.5% |
| For control  |     |      |        |
| Swordfern  | 2-5 | 3-40 | 1-2%   |
| Partial control  |     |      |        |
| Tallowire, Chinese   | —   | —    | 1%     |
| For control. Thorough coverage of foliage is necessary for best results.   |     |      |        |
| Tan oak resprouts  | —   | —    | 2%     |
| For partial control. Apply to resprouts that are less than 3 to 6 feet tall. Best results are obtained with fall applications. |     |      |        |
| Thimbleberry   | 2   | 3-40 | 1%     |
| For control  |     |      |        |
| Tobacco, tree  | —   | —    | 1-2%   |
| Partial control  |     |      |        |
| Trumpet creeper  | 2-3 | 3-40 | 1-1.5% |
| For control  |     |      |        |
| Vine maple   | 2-5 | 3-40 | 1-2%   |
| Partial control  |     |      |        |
| Virginia creeper   | 2-5 | 3-40 | 1-2%   |
| For control  |     |      |        |
| Waxmyrtle, southern  | 2-5 | 3-40 | 1-2%   |
| Partial control  |     |      |        |
| Willow   | 3   | 3-40 | 1%     |
| For control  |     |      |        |

### 13.0 LIMIT OF WARRANTY AND LIABILITY

This Company warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes set forth in the Complete Directions for Use label booklet ("Directions") when used in accordance with those Directions under the conditions described therein. NO OTHER EXPRESS WARRANTY OR IMPLIED WARRANTY OF FITNESS FOR PARTICULAR PURPOSE OR MERCHANTABILITY IS MADE. This warranty is also subject to the conditions and limitations stated herein.

Buyer and all users shall promptly notify this Company of any claims whether based in contract, negligence, strict liability, other tort or otherwise.

Buyer and all users are responsible for all loss or damage from use or handling which results from conditions beyond the control of this Company, including, but not limited to, incompatibility with products other than those set forth in the Directions, application to or contact with desirable vegeta-

bon, unusual weather, weather conditions which are outside the range considered normal at the application site and for the time period when the product is applied, as well as weather conditions which are outside the application ranges set forth in the Directions, application in any manner not explicitly set forth in the Directions, moisture conditions outside the moisture range specified in the Directions, or the presence of products other than those set forth in the Directions in or on the soil, crop or treated vegetation.

THE EXCLUSIVE REMEDY OF THE USER OR BUYER, AND THE LIMIT OF THE LIABILITY OF THIS COMPANY OR ANY OTHER SELLER FOR ANY AND ALL LOSSES, INJURIES OR DAMAGES RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT (INCLUDING CLAIMS BASED IN CONTRACT, NEGLIGENCE, STRICT LIABILITY, OTHER TORT OR OTHERWISE) SHALL BE THE PURCHASE PRICE PAID BY THE USER OR BUYER FOR THE QUANTITY OF THIS PRODUCT INVOLVED, OR, AT THE ELECTION OF THIS COMPANY OR ANY OTHER SELLER, THE REPLACEMENT OF SUCH QUANTITY, OR, IF NOT ACQUIRED BY PURCHASE, REPLACEMENT OF SUCH QUANTITY. IN NO EVENT SHALL THIS COMPANY OR ANY OTHER SELLER BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES.

Buyer and all users are deemed to have accepted the terms of this LIMIT OF WARRANTY AND LIABILITY which may not be varied by any verbal or written agreement.

Bullet, Harness, Lariat, Lasso, Micro-Tech, Partner, and TrailSort are registered trademarks of Monsanto Company.

Bladex, Canopy, Estrazine, Gemini, Karmex, Krovar, Lesone, Lorex, and Preview are trademarks of E.I. duPont de Nemours and Company.

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Direx and Linex are trademarks of Griftec Company.

Skin-Trol is a trademark of Oron Italia Company.

This product is protected by U.S. Patent No. 4,405,531.

Other patents pending.

No license granted under any non-U.S. patent(s).

EPA Reg. No. 524-475

In case of an emergency involving this product,  
Call Collect, day or night, (314) 594-4000.

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MONSANTO COMPANY  
ST. LOUIS, MISSOURI, 63167 U.S.A.

21137W4-2/CG

THE AMOUNT, FREQUENCY AND TIME OF APPLICATION  
OF GLYPHOSATE IN ALL FOOD COMMODITIES  
(INCLUDING ORCHARD TYPE CROPS  
AND OTHER FOOD CROPS)

A 10x10 grid of dots representing a sparse matrix. The dots are arranged in a pattern that suggests a banded structure with some off-diagonal elements, typical of a discretized differential equation system.

Revised 3/31/00

General Directions for Use  
Roundup® Ultra Herbicide  
EPA Reg. No. 524-475

FOR ALL CROP GROUPS AND MISCELLANEOUS CROP  
GROUPS AS EXHIBITED IN SECTION F.

ADD AS NEW SECTIONS TO THE EXISTING LABEL: Orchard Type Crops ( *Including crop types with growth habits, culture and harvested portion similar to 'Citrus Crops', 'Small Fruits and Berries', 'Tree Fruits', 'Tree Nuts', 'Tropical Crops', and 'Vine Crops'* ) and Other Food Crop Categories ( *Including other crops types that have similar growth habits, culture, and harvested portion similar to labeled crop categories such as 'Asparagus', 'Cereal Crops', 'Corn', 'Grain Sorghum (Milo)', 'Peanuts', and 'Vegetable Crops' in addition to other crops such as culinary herbs and medicinal/nutraceutical plants* ) to the label.

8.25 Orchard Type Crops

LABELED CROPS: All Orchard Type crops other than those listed in other sections of the label.<sup>1</sup>

USE INSTRUCTIONS: General weed control, preplant (site preparation), strips(in row), chemical mowing(growth suppression) and middles(between rows).

NOTE: FOR GENERAL USE DIRECTIONS, SEE THE 'TREE, NUT AND VINE (GENERAL)' SECTION. FOR 'CHEMICAL MOWING', REFER TO THAT SECTION OF THE LABEL. THE FOLLOWING DIRECTIONS ARE SPECIFIC TO ORCHARD TYPE CROPS OTHER THAN THOSE LISTED IN OTHER PARTS OF THIS LABEL.

PRECAUTIONS, RESTRICTIONS: Applications should not be made when green shoots, bark, canes, fruit, foliage or exposed roots are present in the spray zone or subject to spray drift. Remove suckers and low hanging branches prior to application. Avoid

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<sup>1</sup> Please note that the Roundup® Ultra label is written such that the application rates are dependent on the weeds to be controlled ( Sections 10, 11 and 12 of label), and range from 0.37 to 5 quarts (0.27 to 3.75 lbs acid equivalent or 0.36 to 5 lbs. isopropylamine salt (ai)) per acre. Note: See Registered Roundup® Ultra Label (EPA Reg. No. 524-475 in Section A for a complete copy of Registered Uses and General Product Information.

applications near trees with recent pruning wounds. Apply only to trees which have become established. EXTREME CARE MUST BE TAKEN TO ENSURE NO PART OF THE TREE IS CONTACTED BY HERBICIDE SOLUTION, SPRAY DRIFT OR MIST.

Any application equipment listed in this section may be used for preplant (site preparation ) application and middles. For strip applications in which there is sufficient clearance, directed sprays may be used. Only shielded boom sprayers and wiper equipment capable of preventing contact with any plant part should be used in Orchard Type crops with the potential for contact. The plant type, growth habit, culture and harvested portion of the Orchard Type crop should be compared to crops listed in the 'Citrus Crops', 'Small Fruits and Berries', 'Tree Fruits', 'Tree Nuts', 'Tropical Crops', and 'Vine Crops' sections as a guide for the appropriate application technique.

Allow a minimum of 14 days between last application and harvest except as noted for closer intervals and application techniques in other parts of this label.

## 8.26 OTHER FOOD CROPS

**LABELED CROPS:** All food crops, culinary herbs and medicinal/nutraceutical crops other than those listed in other sections of the label.<sup>2</sup>

**USE INSTRUCTIONS:** Chemical fallow, preplant fallow beds, preplant, preemergence, post directed hooded applications and postharvest.

**NOTE:** FOR CHEMICAL FALLOW AND PREPLANT FALLOW BED APPLICATIONS USE DIRECTIONS, SEE THE 'FALLOW SYSTEMS' SECTION OF THIS LABEL.

**PRECAUTIONS, RESTRICTIONS:** Preplant applications must be made at least 3 days prior to transplanting. When applying this product prior to transplanting crops into plastic mulch, care must be taken to remove residues of this product from the plastic prior to transplanting. Residues can be removed by a single 0.5 inch application of water either by natural rainfall or via a sprinkler system. This product may be applied preemergence after or at planting of direct seeded crops. The preemergence

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<sup>2</sup> Please note that the Roundup® Ultra label is written such that the application rates are dependent on the weeds to be controlled ( Sections 10, 11 and 12 of label), and range from 0.37 to 5 quarts (0.27 to 3.75 lbs acid equivalent or 0.36 to 5 lbs. Isopropylamine salt (ai)) per acre. Note: See Registered Roundup® Ultra Label (EPA Reg. No. 524-475 in Section A for a complete copy of Registered Uses and General Product Information.

application method must be used prior to the emergence of the crop. EXTREME CARE MUST BE TAKEN TO ENSURE THAT THERE IS NO PART OF A SEED OR EMERGING SEEDLING CAPABLE OF BEING CONTACTED AND THAT THE SOIL IS TOTALLY COVERING THE SEED OR DEVELOPING SEEDLING AT APPLICATION. ENSURE THAT NO PART OF ANY SEED OR EMERGING SEEDLING IS CONTACTED BY HERBICIDE SOLUTION, SPRAY DRIFT OR MIST.

For preemergence applications prior to the emergence of perennial crops with a growth habit similar to asparagus, follow all use precautions under that section for preemergence applications. For medicinal/nutraceutical plants or other crop plants that have a growth habit and culture more similar to 'Orchard Type Crops', follow the use patterns and precautions described in that section.

Postdirected hooded applications are applied to mulched or unmulched row middles after crop establishment. Postdirected applications must be made at least 14 days prior to harvest. PRECAUTIONS, RESTRICTIONS: Applications should not be made when green shoots, bark, canes, fruit, foliage or exposed roots are present in the spray zone or subject to spray drift.

Postharvest applications may be applied after the final harvest to control weeds or suppress regrowth of annual crops or for renovation of biennial or perennial crop beds. Higher rates may be needed to control large weeds which were growing in the crop at the time of harvest. Postharvest applications must be made at least 14 days prior to planting the next crop. Do not harvest or feed treated vegetation.

Note: See Registered Roundup® Ultra Label (EPA Reg. No. 524-475) in Section A for a complete copy of Registered Uses and General Product Information.

SECTION B

THE AMOUNT, FREQUENCY AND TIME OF APPLICATION  
OF GLYPHOSATE IN ALL FOOD COMMODITIES  
(INCLUDING ORCHARD TYPE CROPS  
AND OTHER FOOD CROPS)

General Directions for Use  
Roundup® Ultra Herbicide  
EPA Reg. No. 524-475

**FOR ALL CROP GROUPS AND MISCELLANEOUS CROP  
GROUPS AS EXHIBITED IN SECTION F.**

**ADD AS NEW SECTIONS TO THE EXISTING LABEL:** Orchard Type Crops ( *Including crop types with growth habits, culture and harvested portion similar to 'Citrus Crops', 'Small Fruits and Berries', 'Tree Fruits', 'Tree Nuts', 'Tropical Crops', and 'Vine Crops'* ) and Other Food Crop Categories ( *Including other crops types that have similar growth habits, culture, and harvested portion similar to labeled crop categories such as 'Asparagus', 'Cereal Crops', 'Corn', 'Grain Sorghum (Milo)', 'Peanuts', and 'Vegetable Crops' in addition to other crops such as culinary herbs and medicinal/nutraceutical plants* ) to the label.

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**PRECAUTIONS, RESTRICTIONS:** Applications should not be made when green shoots, bark, canes, fruit, foliage or exposed roots are present in the spray zone or subject to spray drift. Remove suckers and low hanging branches prior to application. Avoid

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<sup>1</sup> Please note that the Roundup® Ultra label is written such that the application rates are dependent on the weeds to be controlled ( Sections 10, 11 and 12 of label), and range from 0.37 to 5 quarts (0.27 to 3.75 lbs acid equivalent or 0.36 to 5 lbs. isopropylamine salt (ai)) per acre. Note: See Registered Roundup® Ultra Label (EPA Reg. No. 524-475 in Section A. for a complete copy of Registered Uses and General Product Information.



applications near trees with recent pruning wounds. Apply only to trees which have become established. **EXTREME CARE MUST BE TAKEN TO ENSURE NO PART OF THE TREE IS CONTACTED BY HERBICIDE SOLUTION, SPRAY DRIFT OR MIST.**

Any application equipment listed in this section may be used for preplant (site preparation) application and middles. For strip applications in which there is sufficient clearance, directed sprays may be used. Only shielded boom sprayers and wiper equipment capable of preventing contact with any plant part should be used in Orchard Type crops with the potential for contact. The plant type, growth habit, culture and harvested portion of the Orchard Type crop should be compared to crops listed in the 'Citrus Crops', 'Small Fruits and Berries', 'Tree Fruits', 'Tree Nuts', 'Tropical Crops', and 'Vine Crops' sections as a guide for the appropriate application technique.

Allow a minimum of 14 days between last application and harvest except as noted for closer intervals and application techniques in other parts of this label.

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**PRECAUTIONS, RESTRICTIONS:** Preplant applications must be made at least 3 days prior to transplanting. When applying this product prior to transplanting crops into plastic mulch, care must be taken to remove residues of this product from the plastic prior to transplanting. Residues can be removed by a single 0.5 inch application of water either by natural rainfall or via a sprinkler system. This product may be applied preemergence after or at planting of direct seeded crops. The preemergence

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application method must be used prior to the emergence of the crop. EXTREME CARE MUST BE TAKEN TO ENSURE THAT THERE IS NO PART OF A SEED OR EMERGING SEEDLING CAPABLE OF BEING CONTACTED AND THAT THE SOIL IS TOTALLY COVERING THE SEED OR DEVELOPING SEEDLING AT APPLICATION. ENSURE THAT NO PART OF ANY SEED OR EMERGING SEEDLING IS CONTACTED BY HERBICIDE SOLUTION, SPRAY DRIFT OR MIST.

For preemergence applications prior to the emergence of perennial crops with a growth habit similar to asparagus, follow all use precautions under that section for preemergence applications. For medicinal/nutraceutical plants or other crop plants that have a growth habit and culture more similar to 'Orchard Type Crops', follow the use patterns and precautions described in that section.

Postdirected hooded applications are applied to mulched or unmulched row middles after crop establishment. Postdirected applications must be made at least 14 days prior to harvest. PRECAUTIONS, RESTRICTIONS: Applications should not be made when green shoots, bark, canes, fruit, foliage or exposed roots are present in the spray zone or subject to spray drift.

Postharvest applications may be applied after the final harvest to control weeds or suppress regrowth of annual crops or for renovation of biennial or perennial crop beds. Higher rates may be needed to control large weeds which were growing in the crop at the time of harvest. Postharvest applications must be made at least 14 days prior to planting the next crop. Do not harvest or feed treated vegetation.

Note: See Registered Roundup® Ultra Label (EPA Reg. No. 524-475) in Section A for a complete copy of Registered Uses and General Product Information.

SECTION C

FULL REPORT OF INVESTIGATIONS MADE WITH RESPECT TO THE  
SAFETY OF THE PESTICIDE CHEMICAL GLYPHOSATE

Please refer to the letter of authorization, Page 3, to access the following data:

- a) Human safety data
- b) Domestic animal safety data
- c) Fish and wildlife safety data

SECTION D

THE RESULTS OF TESTS ON THE AMOUNT OF GLYPHOSATE  
RESIDUES REMAINING IN OR ON ALL FOOD COMMODITIES

## SECTION D

### SUMMARY

The IR-4 Project received requests from Florida, California, Texas, North Dakota and New Jersey for the clearance of glyphosate in/on numerous crops (see section G). Glyphosate is needed for general weed control in these crops as there is no economical alternative available for these use patterns.

IR-4 grouped the label into two general use patterns for ease of use and to highlight the specific use patterns we are pursuing in this petition. Applications of glyphosate in Orchard Type Crops would consist of general weed control, preplant (site preparation), strips (in row), chemical mowing (growth suppression) and middles (between rows). The preharvest interval would be 14 days. Extensive experience and data with glyphosate in/on fruit tree and nut crops has shown that when orchard floor applications are made, no detectable residues of the herbicide are found in the harvested fruit. Applications of glyphosate in All Other Food Crops would consist of chemical fallow (broadcast or spot treatment at least 30 days before planting), preplant fallow beds (application to fallow beds at least 30 days before planting), preplant (before or during planting), preemergence (after planting and prior to crop emergence), and postharvest (after final harvest). All of these applications would control a broad spectrum of weeds. Briefly, EPA has an adequate database concerning the lack of residues of glyphosate above the proposed tolerance in Section F in crops similar to Orchard Type Crops and Other Food Crops<sup>3</sup>. Due to the database available to EPA on glyphosate's fate, it is unlikely that residues would be above the proposed tolerance, therefore it is reasonable to establish the tolerance requested in Section F.

At the moment, there are very few tools available to combat insect, disease and weed problems in minor crops. This lack of crop protection tools severely limits production and potential expansion of minor crops especially the ultra minor crops like herbs, spices and medicinals. Progress in the development of residue data has been slow due to the time and expense of generating data on each of the numerous commodities. With improved production tools, the projections for expansion of minor crops is good. For example, there has been increased interest in medicinal crops.

Glyphosate is a postemergence systemic herbicide with no residual activity. It is generally non-selective and gives broad spectrum control of many annual and

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<sup>3</sup> See page 3 (MRID pages 1 to 16) of this petition

perennial weeds. Glyphosate moves through the plant from the point of foliage contact to and into the root system. Visible effects on most annual weeds occurs within 2 to 4 days, but on most perennial weeds may not occur for 7 days or more. Extremely cool or cloudy weather following treatment may slow activity of this product and delay development of visual symptoms. Visible effects are a gradual wilting and yellowing of the plant which advances to complete browning of above-ground growth and deterioration of underground plant parts.

Weeds must be emerged at the time of application to be controlled by this product. Weeds germinating from seed after application will not be controlled. Unemerged plants from unattached underground rhizomes or root stocks of perennials will not be affected by the herbicide and continue to grow.

As glyphosate is already registered on most major and minor commodities, the daily consumption of these additional crops (mostly herbs and spices) is relatively limited and most would probably qualify as Low Dietary Intake (LDI) crops under the EPA definition, FR:Vol 51, No. 63, pp 11341-11346, although since these are general use groups rather than specific commodities, they would not be specified on the list.

As shown in 40 CFR 180.364 (included in this section), tolerances for glyphosate exist for a number of crops similar to Orchard Type Crops such as tree fruits, tree nuts, tropical crops, and vine crops. Tolerances also exist in crops similar to Other Food Crops such as asparagus, cereal crops, peanuts, and various vegetable crop groups. Glyphosate has been reviewed under FQPA with recent tolerances on Tropical Crops in EPA Rule, FR:Vol 63, No. 195 pg. 54058-54066 (included). Sections A and B demonstrate that the proposed application methods of glyphosate in Orchard Type Crops and Other Food Crops will be similar to existing methods. Therefore, no additional data should be needed in order to establish a tolerance for Orchard Type Crops and Other Food Crops. Establishing the tolerance (Section F) for glyphosate in/on all food commodities is appropriate and will not expose animals, man or the environment to unreasonable adverse effects.

IR-4 grouped the label into two general use patterns for ease of use and to highlight the specific use patterns that we are pursuing in this petition. These specific use patterns would not result in glyphosate coming in contact with the plant and are unlikely to result in residues above the proposed tolerance. The attached list of expanded tolerances for glyphosate was proposed on 27 JUN 96 by EPA for registration purposes.

publication of this proposed rule in the Federal Register that this rulemaking proposal be referred to an Advisory Committee in accordance with section 408(a) of the FFDCA.

To satisfy requirements for analysis specified by Executive Order 12866 and the Regulatory Flexibility Act, EPA has considered impacts of this proposal, and determined that they will be negligible.

#### V. References

The following reference was used in the preparation of this final rule:  
U.S. Environmental Protection Agency, Registration Eligibility Document (RED), Glyphosate Case 0172, September 1993.

#### VI. Regulatory Assessment Requirements

To satisfy requirements for analysis specified by Executive Order 12866, the Regulatory Flexibility Act, the Paperwork Reduction Act, and the Unfunded Mandates Reform Act, EPA has analyzed the impacts of this proposal.

##### A. Executive Order 12866

Under Executive Order 12866 (58 FR 51735, October 4, 1993), the Agency must determine whether the regulatory action is "significant" and therefore subject to all the requirements of the Executive Order (i.e., Regulatory Impact Analysis, review by the Office of Management and Budget (OMB)). Under section 3(f), the order defines "significant" as those actions likely to lead to a rule (1) having an annual effect on the economy of \$100 million or more, or adversely and materially affecting a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local or tribal governments or communities (also known as "economically significant"); (2) creating serious inconsistency or otherwise interfering with an action taken or planned by another agency; (3) materially altering the budgetary impacts of

entitlement, grants, user fees, or loan programs; or (4) raising novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this Executive Order.

Pursuant to the terms of this Executive Order, EPA has determined that this rule is not "significant" and is therefore not subject to OMB review.

##### B. Regulatory Flexibility Act

Pursuant to the requirements of the Regulatory Flexibility Act (5 U.S.C. 601-612), the Administrator has

determined that regulations establishing new tolerances or raising tolerance levels or establishing exemptions from tolerance requirements do not have a significant economic impact on a substantial number of small entities. A certification statement explaining the factual basis for this determination was published in the Federal Register of May 4, 1991 (46 FR 24950).

##### C. Paperwork Reduction Act

This proposed regulatory action does not contain any information collection requirements subject to review by OMB under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

##### D. Unfunded Mandates Reform Act

This action does not impose any enforceable duty, or contain any "unfunded mandates" as described in Title II of the Unfunded Mandates Reform Act of 1995 (Pub. L. 104-4), or require prior consultation as specified by Executive Order 12875 (58 FR 58093, October 28, 1993), entitled Enhancing the Intergovernmental Partnership, or special consideration as required by Executive Order 12896 (59 FR 7629, February 16, 1994).

##### List of Subjects

##### 40 CFR Part 180

Environmental Protection, Administrative practice and procedure, Agricultural commodities, Pesticides and pests, Reporting and recordkeeping requirements.

##### 40 CFR Part 185

Food additives, Pesticides and pest.

##### 40 CFR Part 186

Animal feeds, Pesticides and pest. Dated: June 20, 1996.

Lola Rossi,

Director, Special Review and Reregistration Division, Office of Pesticide Programs.

Therefore, 40 CFR, Chapter I, parts 180, 185 and 186 are proposed to be amended as follows:

##### PART 180—(AMENDED)

##### 1. In Part 180:

a. The authority citation for part 180 continues to read as follows:  
Authority: 21 U.S.C. 346a and 371.

b. Section 180.364 is revised to read as follows:

§ 180.364 Glyphosate, tolerances for residues.

(a) Tolerances are established for the residues of glyphosate (N-phosphonomethyl glycine) per se resulting from application of the

isopropylamine salt of glyphosate and/or the monoammonium salt of glyphosate in or on the following agricultural commodities:

| Commodity   | Parts per million |
|---|-------------------|
| Almond, hulls   | 25                |
| Asparagus   | 0.5               |
| Atemoya   | 0.2               |
| Avocado   | 0.2               |
| Banana  | 0.2               |
| Bartlett cherry   | 0.2               |
| Berries group   | 0.2               |
| Brassica (Cole) leafy vegetable group                                 | 0.2               |
| Breadfruit  | 0.2               |
| Bud vegetables (Allium spp.) group                                    | 0.2               |
| Cacao bean  | 0.2               |
| Canistel  | 0.2               |
| Carambola   | 0.2               |
| Cereal grains group (except wheat)                                    | 0.1               |
| Chestnuts   | 0.2               |
| Citrus fruits group   | 0.5               |
| Coconut   | 0.1               |
| Coffee bean, green  | 1.5               |
| Cotton, undelinted seed   | 15                |
| Cranberry   | 0.2               |
| Cucurbit vegetables group   | 0.2               |
| Dale  | 0.2               |
| Fig   | 0.2               |
| Foliage of legume vegetables group (except soybean foliage and hay)   | 0.2               |
| Forage, fodder, and straw of cereal grains group (except wheat straw) | 0.2               |
| Fruiting vegetables (except Cucurbita) group                          | 0.1               |
| Grape   | 0.2               |
| Grass forage, fodder, and hay group                                   | 100               |
| Guava   | 0.2               |
| Jaboticaba  | 0.2               |
| Jackfruit   | 0.2               |
| Kiwifruit   | 0.1               |
| Leafy vegetables (except Brassica vegetables) group                   | 0.2               |
| Leaves of root and tuber vegetables (human food or animal feed) group | 0.2               |
| Legume vegetables (succulent or dried) group (except soybean)         | 5                 |
| Longan  | 0.2               |
| Lycée   | 0.2               |
| Mamey sapote  | 0.2               |
| Mango   | 0.2               |
| Marmaladebox  | 0.2               |
| Non-grass animal feeds (forage and hay) group                         | 200               |
| Olea  | 0.2               |
| Olive   | 0.2               |
| Papaya  | 0.2               |
| Passion fruit   | 0.2               |
| Peanut, hay   | 0.5               |
| Persimmon   | 0.2               |
| Pineapple   | 0.1               |
| Pistachio   | 0.2               |
| Pine fruits group   | 0.2               |
| Pomegranate   | 0.2               |
| Root and tuber vegetables   | 0.2               |
| Sapodilla   | 0.2               |

| Commodity                          | Parts per million | Commodity   | Parts per million | Commodity          | Parts per million |
|------------------------------------|-------------------|---|-------------------|--------------------|-------------------|
| Sapote, black                      | 0.2               | Brassica (Cole) leafy vegetables group                                | 0.1               | Palm, oil, refined | 0.1               |
| Sapote, white                      | 0.2               | Bulb vegetables (Allium spp.) group                                   | 0.1               | Tea, dried         | 1.0               |
| Soursoo                            | 0.2               | Cereal grains group   | 0.1               | Tea, instant       | 7.0               |
| Soybean, seed                      | 20                | Citrus fruits group   | 0.1               |                    |                   |
| Soybean, forage                    | 100               | Cotton, undelinted seed   | 0.1               |                    |                   |
| Soybean, hay                       | 200               | Cucurbit vegetables group   | 0.1               |                    |                   |
| Soybean, aspirated grain fractions | 50                | Foliage of legume vegetables group                                    | 0.1               |                    |                   |
| Stone fruits group                 | 0.2               | Forage, fodder, and straw of cereal grains group                      | 0.1               |                    |                   |
| Strawberry                         | 0.2               | Fruiting vegetables (except Cucurbit) group                           | 0.1               |                    |                   |
| Sugar apple                        | 0.2               | Grass forage, fodder, and hay group                                   | 0.1               |                    |                   |
| Sunflower, seed                    | 0.1               | Hops  | 0.1               |                    |                   |
| Tamarind                           | 0.2               | Leafy vegetables (except Brassica vegetables) group                   | 0.1               |                    |                   |
| Tree nuts group                    | 1.0               | Leaves of root and tuber vegetables (human food or animal feed) group | 0.1               |                    |                   |
| Wheat, grain                       | 5.0               | Legume vegetables (succulent or dried) group                          | 0.1               |                    |                   |
| Wheat, straw                       | 45                | Non-grass animal feeds (forage, fodder, straw, and hay) group         | 0.1               |                    |                   |
|                                    |                   | Okra  | 0.1               |                    |                   |
|                                    |                   | Pome fruits group   | 0.1               |                    |                   |
|                                    |                   | Root and tuber vegetables group                                       | 0.1               |                    |                   |
|                                    |                   | Stone fruits group  | 0.1               |                    |                   |
|                                    |                   | Tree nuts group   | 0.1               |                    |                   |

(b) Tolerances are established for the residues of glyphosate (*N*-phosphonomethyl glycine) *per se* resulting from application of the isopropylamine salt of glyphosate and/or the monoammonium salt of glyphosate for herbicidal and plant growth regulator purposes and/or the sodium sesqui salt for plant regulator purposes in or on the following agricultural commodities:

| Commodity       | Parts per million |
|-----------------|-------------------|
| Cattle, kidney  | 4.0               |
| Cattle, liver   | 2.0               |
| Fish            | 0.25              |
| Goat, kidney    | 4.0               |
| Goat, liver     | 0.5               |
| Hog, kidney     | 4.0               |
| Hog, liver      | 1.0               |
| Horse, kidney   | 4.0               |
| Horse, liver    | 0.5               |
| Peanut          | 0.1               |
| Peanut, hay     | 0.5               |
| Poultry, kidney | 0.5               |
| Poultry, liver  | 0.5               |
| Sheep, kidney   | 4.0               |
| Sheep, liver    | 0.5               |
| Sheefish        | 3.0               |
| Sugarcane       | 2.0               |

(c) Tolerances are established for the residues of glyphosate (*N*-phosphonomethyl glycine) *per se* resulting from the use of irrigation water containing residues of 0.5 ppm following applications on or around aquatic sites on the following agricultural commodities. Where tolerances are established at higher levels from other uses of glyphosate in or on the subject crops, the higher tolerance should also apply to residues from the aquatic uses cited in this paragraph.

| Commodity | Parts per million |
|-----------|-------------------|
| Avocado   | 0.1               |

(b) Tolerances are established for the residues of glyphosate (*N*-phosphonomethyl glycine) *per se* resulting from application of the isopropylamine salt of glyphosate and/or the monoammonium salt of glyphosate for herbicidal and plant growth regulator purposes and/or the sodium sesqui salt for plant regulator purposes in or on the following agricultural commodities:

PART 185—[AMENDED]

2. In Part 185:

a. The authority citation for part 185 continues to read as follows:

Authority: 21 U.S.C. 346a and 348.

b. Section 185.3500 is revised to read:

§ 185.3500 Glyphosate.

(a) Food additive regulations are established for the residues of glyphosate (*N*-phosphonomethyl glycine) *per se* when present therein as a result of the herbicide application to the growing crops:

(1) Glyphosate (*N*-phosphonomethyl glycine) *per se* resulting from the application of the isopropylamine salt of glyphosate for herbicidal purposes and/or the sodium sesqui salt for plant growth regulator purposes.

| Commodity           | Parts per million |
|---------------------|-------------------|
| Sugarcane, molasses | 30.0              |

(2) Glyphosate (*N*-phosphonomethyl glycine) *per se* resulting from the application of the isopropylamine salt of glyphosate for herbicidal purposes.

| Commodity | Parts per million |
|-----------|-------------------|
| Olive     | 0.1               |

(3) Glyphosate (*N*-phosphonomethyl glycine) *per se* resulting from the application of the isopropylamine salt of glyphosate or the monoammonium salt of glyphosate for herbicidal purposes.

| Commodity                         | Parts per million |
|-----------------------------------|-------------------|
| Wheat bran, middlings, and shorts | 20.0              |

(h) [Reserved]

PART 186—[AMENDED]

2. In Part 186:

a. The authority citation for part 186 continues to read as follows:

Authority: 21 U.S.C. 348.

b. Section 186.3500 is revised to read:

§ 186.3500 Glyphosate.

A feed additive regulation is established permitting residues of glyphosate *per se* (*N*-phosphonomethyl glycine) in or on the following feed commodities from application of the isopropylamine salt of glyphosate and/or the monoammonium salt of glyphosate to the raw agricultural commodities citrus and soybeans:

| Commodity           | Parts per million |
|---------------------|-------------------|
| Citrus, pulp, dried | 1.5               |
| Soybean, hulls      | 100               |

(FR Doc. 96-16587 Filed 6-26-96; 6:45 am.)  
BILLING CODE 5440-60-P

FEDERAL COMMUNICATIONS COMMISSION

47 CFR Part 73

(MCM Docket No. 96-120, FCC 96-236)

Grandfathered Short-Spaced FM Stations

AGENCY: Federal Communications Commission.

ACTION: Proposed rule.

SUMMARY: This Notice of Proposed Rule Making (NPRM) in MCM Docket No. 96-120 seeks comment regarding various proposals to modify a current rule to permit certain short-spaced stations to make changes based on a showing that no interference is caused or received, or



Dated: September 29, 1998.

James Jones,

Director, Registration Division, Office of Pesticide Programs.

Therefore, 40 CFR chapter I is amended as follows:

**PART 180—[AMENDED]**

1. The authority citation for part 180 continues to read as follows:

Authority: 21 U.S.C. 346a and 371.

2. In § 180.364, paragraph (a), by designating the text following the paragraph heading as paragraph (a)(1), and by adding paragraph (a)(2) to read as follows:

§ 180.364 Glyphosate; residues for tolerances.

(a) \* \* \*

(2) Tolerances are established for residues of glyphosate N-(phosphonomethyl) glycine in or on the commodities list in the table as follows:

| Commodity  | Pars per million |
|------------|------------------|
| Durian     | 0.2              |
| Mangosteen | 0.2              |
| Rambutan   | 0.2              |

[FR Doc. 98-26906 Filed 10-7-98; 8:45 am]  
BILLING CODE 5440-45-P

**ENVIRONMENTAL PROTECTION AGENCY**

40 CFR Part 180

[OPP-300739; FRL-5034-1]

RUN 2070-AB78

Sethoxydim; Pesticide Tolerance

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

**SUMMARY:** This regulation establishes a tolerance for combined residues of sethoxydim (2-[1-(ethoxymino)butyl]-5-[2-(ethylthio)propyl]-3-hydroxy-2-cyclohexen-1-one) and its metabolites containing the 2-cyclohexen-1-one moiety (calculated as the herbicide) in or on apricots, cherries (sweet and sour), nectarines, peaches, succulent beans, bean forage, soybeans, grapes, raisins, cilantro, leafy vegetable (except Brassica) crop group, tuberous and corn vegetable subgroup, garden beets,

caneberry crop sub group, and globe artichoke. This regulation also deletes the established tolerances for raisin waste, grape pomace, celery, head lettuce, leaf lettuce, spinach, endive(escarole), potato, sweet potato, and raspberry. BASF Corporation and Interregional Research Project Number (IR-4) requested these tolerances under the Federal Food, Drug and Cosmetic Act (FFDCA), as amended by the Food Quality Protection Act of 1996 (Pub. L. 104-170).

**DATES:** This regulation is effective October 8, 1998. Objections and requests for hearings must be received by EPA on or before December 7, 1998.

**ADDRESSES:** Written objections and hearing requests, identified by the docket control number, [OPP-300739], must be submitted to: Hearing Clerk (1900), Environmental Protection Agency, Rm. M3708, 401 M St., SW., Washington, DC 20460. Fees accompanying objections and hearing requests shall be labeled "Tolerance Petition Fees" and forwarded to: EPA Headquarters Accounting Operations Branch, OPP (Tolerance Fees), P.O. Box 360277M, Pittsburgh, PA 15251. A copy of any objections and hearing requests filed with the Hearing Clerk identified by the docket control number, [OPP-300739], must also be submitted to: Public Information and Records Integrity Branch, Information Resources and Services Division (7502C), Office of Pesticide Programs, Environmental Protection Agency, 401 M St., SW., Washington, DC 20460. In person, bring a copy of objections and hearing requests to Rm. 119, Crystal Mall #2, 1921 Jefferson Davis Hwy., Arlington, VA.

A copy of objections and hearing requests filed with the Hearing Clerk may also be submitted electronically by sending electronic mail (e-mail) to: opp-docket@epamail.epa.gov. Copies of objections and hearing requests must be submitted as an ASCII file avoiding the use of special characters and any form of encryption. Copies of objections and hearing requests will also be accepted on disks in WordPerfect 5.1/6.1 file format or ASCII file format. All copies of objections and hearing requests in electronic form must be identified by the docket control number [OPP-300739]. No Confidential Business Information (CBI) should be submitted through e-mail. Electronic copies of objections and hearing requests on this rule may be filed online at many Federal Depository Libraries.

**FOR FURTHER INFORMATION CONTACT:** By mail: Jim Tompkins or Hoyt Jamerson, Registration Division (7505C), Office of Pesticide Programs, Environmental

Protection Agency, 401 M St., SW., Washington, DC 20460. Office location, telephone number, and e-mail address: Crystal Mall #2, 1921 Jefferson Davis Hwy., Arlington, VA, Jim Tompkins (703) 305 5697, Hoyt Jamerson (703) 305 9368, e-mail: Tompkins.jim or jamerson.hoyt@epamail.epa.gov.

**SUPPLEMENTARY INFORMATION:** In the Federal Register of May 16, 1997 (62 FR 27028)(FRL-5717-6) and August 5, 1998 (63 FR 41829)(FRL-5799-6), EPA issued a notice pursuant to section 408 of the Federal Food, Drug, and Cosmetic Act (FFDCA), 21 U.S.C. 346a(e) announcing the filing of a pesticide petition (PP) for tolerance by BASF Corporation, P.O. Box 13528, Research Triangle Park, NC 27709, and Interregional Research Project Number 4 (IR-4), New Jersey Agricultural Experimental Station, Rutgers University, New Brunswick, New Jersey 08903. These notices included a summary of the petitions prepared by BASF Corporation, the registrants, and IR-4. There were no comments received in response to the notice of filing.

The petition requested that 40 CFR 180.412 be amended by establishing tolerances for combined residues of the herbicide sethoxydim (2-[1-(ethoxymino)butyl]-5-[2-(ethylthio)propyl]-3-hydroxy-2-cyclohexen-1-one and its metabolites containing the 2-cyclohexen-1-one moiety (calculated as the herbicide), in or on 9F3408 (62 FR 27028) apricots at 0.2 part per million (ppm), cherries (sweet and sour) at 0.2 ppm, nectarine at 0.2 ppm, and peaches at 0.2 ppm; 6F4695 (63 FR 41829) grapes at 1.0 ppm, succulent beans at 15.0 ppm; bean forage at 15.0 ppm, soybeans at 16.0 ppm, and raisins at 2.0 ppm; 6E4953 (63 FR 41829) leafy vegetable (except Brassica) crop group at 4.0 ppm and cilantro at 4.0 ppm; 6E4725 (63 FR 41829) tuberous and corn vegetable subgroup at 4.0 ppm and garden beet at 1.0 ppm; 6E4698 (63 FR 41829) artichokes at 5.0 ppm; and 6E4697 (63 FR 41829) caneberry crop subgroup at 5.0 ppm.

The notice issued August 5, 1998 (63 FR 41829) for 6F4695 proposed deleting the established tolerances for raisin waste at 1.0 ppm and grape pomace at 6.0 ppm since they are considered insignificant animal feed commodities and are no longer of regulatory concern.

The August 5, 1998 notice also proposed to remove or delete the established tolerances for celery at 1.0 ppm, head lettuce at 1.0 ppm, leaf lettuce at 2.0 ppm, spinach at 4.0 ppm, endive(escarole) at 2.0 ppm (6E4753); potato at 4.0 ppm, and sweet potato at

## SECTION E

### PRACTICAL METHODS FOR REMOVING RESIDUE THAT EXCEEDS ANY PROPOSED TOLERANCE

Since it is unlikely that residues of glyphosate in or on All Food Commodities will exceed the proposed tolerance, methods for removing the residues are unnecessary.

SECTION F

PROPOSED TOLERANCE FOR THE PESTICIDE CHEMICAL GLYPHOSATE IN  
OR ON  
ALL FOOD COMMODITIES

Amends 40 CFR 180.364

The petitioner on behalf of the Agricultural Experiment Stations of Florida, Texas, California, North Dakota, and New Jersey requests the establishment of a tolerance for the residues of glyphosate (N-(phosphonomethyl)glycine) resulting from the application of glyphosate, the isopropylamine salt of glyphosate and/or the monoammonium salt of glyphosate in or on the following food commodities:

*Revised 3/31/80*

|                              |  |                      |
|------------------------------|--|----------------------|
| Crop Group#<br>or Subgroup # | Crop Group/Subgroup Tolerance Expression | Parts per<br>Million |
|------------------------------|--|----------------------|

|     |   |                          |
|-----|---|--------------------------|
| 10  | White Sapote and(Ugli Fruit)* (Rep crops-<br>Sweet orange, lemon, and grapefruit)   | 0.5                      |
| 14  | Pistachio* (Rep crop-Almond and pecan)  | 1.0                      |
| 17  | Grass, Forage, Fodder and Hay, Group*<br>(Rep crop- Bermuda grass, bluegrass, and<br>bromegrass or fescue)  | 200                      |
| 19A | Herb subgroup * (Rep crop-Basil and chive)  | 0.2                      |
| 19B | Spice subgroup*   | 7.0                      |
| 99  | Tropical Fruits :<br><br>Custard apple*, ilama* biriba*<br><br>Spanish lime*, pulasan*<br><br>star apple*,<br><br>Feijoa*, wax jambu*,<br><br>Ambarella*, Barbados Cherry*, Mamey<br>apple* | 0.2                      |
| 99  | Oil seed crops -<br>Crambe, seed*<br>Flax, seed*<br>Mustard ,seed*<br>Safflower, seed*  | 0.1<br>0.1<br>0.1<br>0.1 |

\* New tolerance request.



| Crop Group#<br>or Subgroup # | Crop Group/Subgroup Tolerance Expression | Parts per<br>Million |
|------------------------------|--|----------------------|
| 99                           | Lesquerella, seed*                       | 0.1                  |
| 99                           | Leucaena, forage*                        | 200.0                |
| 99                           | Lingonberry*                             | 0.2                  |
| 99                           | Meadowfoam, seed*                        | 0.1                  |
| 99                           | Mioga, flower*                           | 0.2                  |
| 99                           | Nut, pine*                               | 1.0                  |
| 99                           | Okra*                                    | 0.5                  |
| 99                           | Oregano, Mexican, leaves*                | 2.0                  |
| 99                           | Palm heart, leaves*                      | 0.2                  |
| 99                           | Papaya, mountain*                        | 0.2                  |
| 99                           | Pawpaw*                                  | 0.2                  |
| 99                           | Pepper leaf, fresh leaves*               | 0.2                  |
| 99                           | Perilla, tops*                           | 1.8                  |
| 99                           | Quinoa, grain*                           | 5.0                  |
| 99                           | Salal*                                   | 0.2                  |
| 99                           | Sesame, seed*                            | 0.1                  |
| 99                           | Stevia, dried leaves*                    | 1.0                  |
| 99                           | Surinam cherry*                          | 0.2                  |
| 99                           | Teff, grain*                             | 5.0                  |
| 99                           | Ti, leaves*                              | 0.2                  |
| 99                           | Ti, roots*                               | 0.2                  |
| 99                           | Water spinach, tops*                     | 0.2                  |
| 99                           | Watercress , upland*                     | 0.2                  |
| 99                           | Yacon, tuber*                            | 0.2                  |

\* New tolerance request.

The petitioner also requests the **change of expresion** of the tolerance for the residues of glyphosate (N-(phosphonomethyl)glycine) resulting from the application of glyphosate, the isopropylamine salt of glyphosate and/or the monoammonium salt of glyphosate in or on the food commodities:

| Crop Group#<br>or Subgroup # | Crop Group/Subgroup Tolerance Expression  | Parts per<br>Million |
|------------------------------|---|----------------------|
| 01                           | Vegetable Root and Tuber, Group (Except sugar beet)(Rep crops-carrot, potato, radish, ) ●                 | 0.2                  |
| 02                           | Vegetable, Leaves of Root and Tuber, Group (except sugar beet tops)(Rep crops-Turnip and garden beet )●   | 0.2                  |
| 03                           | Vegetable, Bulb, Group ●(Rep crops-Onion, green; and onion, dry bulb)                                     | 0.2                  |
| 04                           | Vegetable, Leafy, Except Brassica, Group ●(Rep crops-celery, head lettuce, leaf lettuce, and spinach)     | 0.2                  |
| 05                           | Vegetable, Brassica, Leafy, Group ● (Rep crops-broccoli or cauliflower; cabbage; and mustard greens)      | 0.2                  |
| 06                           | Vegetable, Legume, Group● (except soybean) (Rep crops- beans succulent and dry and pea succulent and dry) | 5.0                  |
| 07                           | Vegetable, Foliage of Legume, Group●(Except soybean forage and hay)(Rep crops-bean and field pea)         | 0.2                  |
| 08                           | Vegetable, Fruiting, Group●(Rep crops-Tomato, bell pepper, non-bell pepper)                               | 0.1                  |
| 09                           | Vegetable, Cucurbit, Group●(Rep crop-Cucumber, muskmelon, and summer squash)                              | 0.5                  |
| 10                           | Fruit, Citrus, Group ●(Rep crops-Sweet orange, lemon, and grapefruit)                                     | 0.5                  |

● Existing tolerances, with the newest expression for that group.

Crop Group#  
or Subgroup #      Crop Group/Subgroup Tolerance Expression      Parts per  
Million

|    |   |          |
|----|---|----------|
| 11 | Fruit, Pome , Group ●(Rep crop- Apple and pear)                                   | 0.2      |
| 12 | Fruit, Stone, Group ●(Rep crop-Cherry, peach, plum)                               | 0.2      |
| 13 | Berry Group●(Rep crop-Blackberry, and blueberry)                                  | 0.2      |
| 14 | Nut, Tree, Group ● (Rep crop-Almond and pecan)                                    | 1.0      |
| 15 | Grain, Cereal, Group ●(except barley, corn, grain sorghum, oats, and wheat)       | 0.1      |
| 16 | Grain, Cereal, Forage, Fodder, and Straw, Group ●(Except corn, sorghum and wheat) | 100      |
| 18 | Animal Feed, Nongrass, Group ●(Rep crop-Alfalfa and clover)                       | 200      |
| 99 | Barbados cherry ●,Cacao bean ●, Marmaladebox ●, Starfruit ●                       | 0.2      |
| 99 | Strawberry●   | 0.2      |
| 99 | Cranberries●  | 0.2      |
| 99 | Grapes●   | 0.2      |
| 99 | Rapeseed, seed ●<br>Rapeseed Meal ●   | 10<br>15 |
| 99 | Palm heart, leaves ●  | 0.1      |

●Existing tolerances, with the newest expression for that group.



The petitioner also requests the deletion of the tolerance for the residues of glyphosate (N-(phosphonomethyl)glycine resulting from the application of the isopropylamine salt of glyphosate and/or the monoammonium salt of glyphosate in or on the raw agricultural commodity groups:

| Crop/Crop Group/Subgroup Tolerance Expression | Parts per Million |
|---|-------------------|
| Acerola                                       | 0.2               |
| Alfalfa                                       | 200               |
| Alfalfa, forage                               | 75                |
| Alfalfa, fresh and hay                        | 0.2               |
| Alfalfa, hay                                  | 200               |
| Almonds, hulls                                | 1                 |
| Artichokes, Jerusalem                         | 0.2               |
| Legume, forage (except soybean and peanuts)   | 0.4               |
| Bahiagrass                                    | 200               |
| Beets   | 0.2               |
| Bermudagrass                                  | 200               |
| Bluegrass                                     | 200               |
| Bromegrass                                    | 200               |
| Carambola                                     | 0.2               |
| Carrots                                       | 0.2               |
| Celeriac                                      | 0.2               |
| Chickory                                      | 0.2               |
| Citrus, fruits                                | 0.5               |
| Clover  | 200               |
| Cocoa beans                                   | 0.2               |
| Fescue  | 200               |
| Forage grasses                                | 0.2               |

| Crop/Crop Group/Subgroup Tolerance Expression                  | Parts per Million |
|--|-------------------|
| Fruits, small, and berries                                     | 0.2               |
| Genip  | 0.2               |
| Horseradish  | 0.2               |
| Leafy vegetables   | 0.2               |
| Legume Vegetables (Succulent and dried) group(Except soybeans) | 5.0               |
| Nuts   | 0.2               |
| Olives, Imported   | 0.1               |
| Orchardgrass   | 200               |
| Parsnips   | 0.2               |
| Pistachio  | 0.2               |
| Pome fruits  | 0.2               |
| Potatoes   | 0.2               |
| Radishes   | 0.2               |
| Rutabagas  | 0.2               |
| Ryegrass   | 200               |
| Seed and pod vegetables  | 0.2 (N)           |
| Seed and pod vegetables, forage                                | 0.2 (N)           |
| Seed and pod vegetables, hay                                   | 0.2 (N)           |
| Salisfy  | 0.2               |
| Soybeans, Grain  | 20                |
| Sweet potatoes   | 0.2               |
| Timothy  | 200               |
| Turnips  | 0.2               |
| Vegetables, bulb   | 0.2               |
| Vegetables, cucurbit   | 0.5               |
| Vegetables, fruiting (except cucurbits) group                  | 0.1               |

|                                    |     |
|------------------------------------|-----|
| Vegetables, leafy, Brassica (cole) | 0.2 |
| Wheatgrass                         | 200 |
| Yams                               | 0.2 |

**SUMMARY TABLE** -This table is a compilation of the new additions, new expressions and deletions presented in the previous three tables and is intended to be the manner in which the updated list of tolerances is to be published.

**§ 180.364 Glyphosate: tolerances for residues.**

(a) *General.* Tolerances are established for the residues of glyphosate(N-(phosphonomethyl)glycine) resulting from the application of glyphosate, the isopropylamine salt of glyphosate and/or the monoammonium salt of glyphosate in or on the following food commodities:

| Commodity                    | Parts per million |
|------------------------------|-------------------|
| Almond hulls                 | 25                |
| Aloe vera                    | 0.5               |
| Animal Feed, Nongrass, Group | 200               |
| Ambarella                    | 0.2               |
| Artichoke, globe             | 0.2               |
| Asparagus                    | 0.5               |
| Aspirated grain fractions    | 200               |
| Atemoya                      | 0.2               |
| Avocados                     | 0.2               |
| Barley, bran                 | 30                |
| Barley, grain                | 20                |
| Bamboo, shoots               | 0.2               |
| Bananas                      | 0.2               |
| Barbados cherry              | 0.2               |
| Berry Group                  | 0.2               |
| Beets, sugar, dried pulp     | 25                |
| Beets, sugar, roots          | 10                |
| Beets, sugar, tops           | 10                |
| Biriba                       | 0.2               |

| Commodity              | Parts per million |
|------------------------|-------------------|
| Betelnut               | 1.0               |
| Blimbe                 | 0.2               |
| Borage, seed           | 0.1               |
| Breadfruit             | 0.2               |
| Cacao bean             | 0.2               |
| Cactus, fruit          | 0.5               |
| Cactus, pads           | 0.5               |
| Canistel               | 0.2               |
| Canola meal            | 15                |
| Canola seed            | 10                |
| Cattle , kidney        | 4.0               |
| Cattle, liver          | 0.5               |
| Chaya                  | 1.0               |
| Cherimoya              | 0.2               |
| Citrus, pulp, dried    | 1.5               |
| Cotton gin by-products | 100               |
| Coconut                | 0.1               |
| Coffee bean            | 1                 |
| Corn, field, forage    | 1                 |
| Corn, field, grain     | 1                 |
| Corn, field, stover    | 100               |
| Cottonseed             | 15                |
| Cranberries            | 0.2               |
| Crambe, seed           | 0.1               |
| Custard apple          | 0.2               |

| Commodity  | Parts per million |
|--|-------------------|
| Dates  | 0.2               |
| Dokudami   | 2.0               |
| Durian   | 0.2               |
| Epazote  | 1.3               |
| Feijoa   | 0.2               |
| Fig  | 0.2               |
| Fish   | 0.25              |
| Fruit, Citrus, Group   | 0.5               |
| Fruit, Pome, Group   | 0.2               |
| Fruit, Stone, Group  | 0.2               |
| Flax, seed   | 0.1               |
| Galangal, roots  | 0.2               |
| Ginger, white, flower  | 0.2               |
| Gourd, buffalo, seed   | 0.1               |
| Goats, kidney  | 4.0               |
| Goats, liver   | 0.5               |
| Governor's Plum  | 0.2               |
| Gow Kee, leaves  | 0.2               |
| Grain, Cereal Group(except barley, corn, grain sorghum, oats and wheat)        | 0.1               |
| Grain,Cereal, Forage, Fodder, and Straw, Group(Except corn, sorghum and wheat) | 100               |
| Grapes   | 0.2               |
| Grass, Forage, Fodder and Hay, Group   | 200               |
| Guavas   | 0.2               |
| Herb subgroup  | 0.2               |

| Commodity         | Parts per million |
|-------------------|-------------------|
| Hogs, kidney      | 4.0               |
| Hogs, liver       | 0.5               |
| Hops cones, dried | 7.0               |
| Horses, kidney    | 4.0               |
| Horses, liver     | 0.5               |
| Llama             | 0.2               |
| Imbe              | 0.2               |
| Imbu              | 0.2               |
| Jaboticaba        | 0.2               |
| Jackfruit         | 0.2               |
| Jojoba, seed      | 0.1               |
| Juneberry         | 0.2               |
| Kiwifruit         | 0.2               |
| Kava, roots       | 0.2               |
| Kenaf, forage     | 200               |
| Lesquerella, seed | 0.1               |
| Leucaena, forage  | 200               |
| Lingonberry       | 0.2               |
| Longan            | 0.2               |
| Lychee            | 0.2               |
| Mango             | 0.2               |
| Marmaladebox      | 0.2               |
| Mamey apple       | 0.2               |
| Mamey sapote      | 0.2               |
| Mangosteen        | 0.2               |

| Commodity                 | Parts per million |
|---------------------------|-------------------|
| Meadowfoam, seed          | 0.1               |
| Mioga, flower             | 0.2               |
| Mustard, seed             | 0.1               |
| Nut, Tree, Group          | 1                 |
| Oats, grain               | 20                |
| Okra                      | 0.5               |
| Olives                    | 0.2               |
| Oregano, Mexican, leaves  | 2.0               |
| Palm, heart, leaves       | 0.2               |
| Palm oil                  | 0.1               |
| Papaya                    | 0.2               |
| Papaya, mountain          | 0.2               |
| Passion fruit             | 0.2               |
| Pawpaw                    | 0.2               |
| Peanut, forage            | 0.5               |
| Peanut, hay               | 0.5               |
| Peanuts                   | 0.1               |
| Pepper leaf, fresh leaves | 0.2               |
| Peppermint                | 200               |
| Perilla, tops             | 1.8               |
| Persimmon                 | 0.2               |
| Pineapple                 | 0.1               |
| Pine nut                  | 1.0               |
| Pistachio                 | 1.0               |
| Pomegranate               | 0.2               |



| Commodity                           | Parts per million |
|-------------------------------------|-------------------|
| Poultry, kidney                     | 0.5               |
| Poultry, liver                      | 0.5               |
| Pulasan                             | 0.2               |
| Quinoa, grain                       | 5                 |
| Rambutan                            | 0.2               |
| Rapeseed, seed                      | 10                |
| Rapeseed meal                       | 15                |
| Safflower, seed                     | 0.1               |
| Salal                               | 0.2               |
| Sapodilla                           | 0.2               |
| Sapote, black                       | 0.2               |
| Sapote, white                       | 0.2               |
| Sesame, seed                        | 0.1               |
| Sheep, kidney                       | 4                 |
| Sheep, liver                        | 0.5               |
| Shellfish                           | 3                 |
| Sorghum, grain                      | 15                |
| Sorghum, grain, stover              | 40                |
| Soursop                             | 0.2               |
| Soybean, hulls                      | 100               |
| Soybeans, aspirated grain fractions | 50                |
| Soybeans, forage                    | 100               |
| Soybean                             | 20                |
| Soybeans, hay                       | 200               |
| Spanish lime                        | 0.2               |

| Commodity  | Parts per million |
|--|-------------------|
| Spearmint  | 200               |
| Spice subgroup   | 7.0               |
| Star apple   | 0.2               |
| Starfruit  | 0.2               |
| Stevia, dried leaves   | 1.0               |
| Strawberry   | 0.2               |
| Sugar apple  | 0.2               |
| Sugarcane  | 2.0               |
| Sugarcane, molasses  | 30                |
| Sunflower seed   | 0.1               |
| Surinam cherry   | 0.2               |
| Tamarind   | 0.2               |
| Tea, dried   | 1                 |
| Tea, instant   | 7                 |
| Teff, grain  | 5                 |
| Ti, leaves   | 0.2               |
| Ti, roots  | 0.2               |
| Ugli fruit   | 0.5               |
| Vegetable, Root and Tuber, Group<br>(except sugar beets)               | 0.2               |
| Vegetable, Leaves of Root and Tuber,<br>Group (except sugar beet tops) | 0.2               |
| Vegetable, Bulb, Group   | 0.2               |
| Vegetable, Leafy, Except Brassica,<br>Group                            | 0.2               |
| Vegetable, Brassica, Leafy, Group                                      | 0.2               |

| Commodity   | Parts per million |
|---|-------------------|
| Vegetable, Legume, Group (except soybeans)                          | 5.0               |
| Vegetable, Foliage of Legume, Group (except soybean forage and hay) | 0.2               |
| Vegetable, Fruiting, Group  | 0.1               |
| Vegetable, Cucurbit, Group  | 0.5               |
| Wasabi, roots   | 0.2               |
| Water spinach, tops   | 0.2               |
| Watercress, upland  | 0.2               |
| Wheat, grain  | 5                 |
| Wheat Milling Fractions (excluding flour)                           | 20                |
| Wheat, straw  | 85                |
| Yacon, tuber  | 0.2               |

SECTION F

PROPOSED TOLERANCE FOR THE PESTICIDE CHEMICAL GLYPHOSATE IN  
OR ON  
ALL FOOD COMMODITIES

Amends 40 CFR 180.364

The petitioner on behalf of the Agricultural Experiment Stations of Florida, Texas, California, North Dakota, and New Jersey requests the establishment of a tolerance for the residues of glyphosate (N-(phosphonomethyl)glycine) resulting from the application of glyphosate, the isopropylamine salt of glyphosate and/or the monoammonium salt of glyphosate in or on the following food commodities:

| Crop Group#<br>or Subgroup # | Crop Group/Subgroup Tolerance Expression | Parts per<br>Million |
|------------------------------|--|----------------------|
|------------------------------|--|----------------------|

|     |   |                          |
|-----|---|--------------------------|
| 10  | White Sapote and(Ugli Fruit)* (Rep crops-<br>Sweet orange, lemon, and grapefruit)   | 0.5                      |
| 14  | Pistachio* (Rep crop-Almond and pecan)  | 1.0                      |
| 17  | Grass, Forage, Fodder and Hay, Group*<br>(Rep crop- Bermuda grass, bluegrass, and<br>bromegrass or fescue)  | 200                      |
| 19A | Herb subgroup * (Rep crop-Basil and chive)  | 0.2                      |
| 19B | Spice subgroup*   | 7.0                      |
| 99  | Tropical Fruits :<br><br>Custard apple*, ilama* biriba*<br><br>Spanish lime*, pulasan*<br><br>star apple*,<br><br>Feijoa*, wax jambu*,<br><br>Ambarella*, Barbados Cherry*, Mamey<br>apple* | 0.2                      |
| 99  | Oil seed crops -<br>Crambe, seed*<br>Flax, seed*<br>Mustard ,seed*<br>Safflower, seed*  | 0.1<br>0.1<br>0.1<br>0.1 |

\* New tolerance request.

Crop Group# or Subgroup #      Crop Group/Subgroup Tolerance Expression      Parts per Million

|    |                        |     |
|----|------------------------|-----|
| 99 | Aloe vera*             | 0.5 |
| 99 | Cactus, fruit*         | 0.5 |
| 99 | Cactus, pads*          | 0.5 |
| 99 | Kava, roots*           | 0.2 |
| 99 | Artichoke, globe*      | 0.2 |
| 99 | Bamboo, shoots*        | 0.2 |
| 99 | Betelnut*              | 1.0 |
| 99 | Blimbe*                | 0.2 |
| 99 | Borage, seed*          | 0.1 |
| 99 | Chaya*                 | 1.0 |
| 99 | Dokudami*              | 2.0 |
| 99 | Epazote*               | 1.3 |
| 99 | Galangal, roots*       | 0.2 |
| 99 | Ginger, white, flower* | 0.2 |
| 99 | Gourd, buffalo, seed*  | 0.1 |
| 99 | Governor's Plum*       | 0.2 |
| 99 | Gow kee, leaves*       | 0.2 |
| 99 | Hops cones, dried*     | 7.0 |
| 99 | Imbe*                  | 0.2 |
| 99 | Imbu*                  | 0.2 |
| 99 | Jojoba, seed*          | 0.1 |
| 99 | Juneberry*             | 0.2 |
| 99 | Kenaf, forage*         | 200 |

\* New tolerance request.

Crop Group# or Subgroup #      Crop Group/Subgroup Tolerance Expression      Parts per Million

|    |                            |       |
|----|----------------------------|-------|
| 99 | Lesquerella, seed*         | 0.1   |
| 99 | Leucaena, forage*          | 200.0 |
| 99 | Lingonberry*               | 0.2   |
| 99 | Meadowfoam, seed*          | 0.1   |
| 99 | Mioga, flower*             | 0.2   |
| 99 | Nut, pine*                 | 1.0   |
| 99 | Okra*                      | 0.5   |
| 99 | Oregano, Mexican, leaves*  | 2.0   |
| 99 | Palm heart, leaves*        | 0.2   |
| 99 | Papaya, mountain*          | 0.2   |
| 99 | Pawpaw*                    | 0.2   |
| 99 | Pepper leaf, fresh leaves* | 0.2   |
| 99 | Perilla, tops*             | 1.8   |
| 99 | Quinoa, grain*             | 5.0   |
| 99 | Salal*                     | 0.2   |
| 99 | Sesame, seed*              | 0.1   |
| 99 | Stevia, dried leaves*      | 1.0   |
| 99 | Surinam cherry*            | 0.2   |
| 99 | Teff, grain*               | 5.0   |
| 99 | Ti, leaves*                | 0.2   |
| 99 | Ti, roots*                 | 0.2   |
| 99 | Water spinach, tops*       | 0.2   |
| 99 | Watercress , upland*       | 0.2   |
| 99 | Yacon, tuber*              | 0.2   |

\* New tolerance request.

The petitioner also requests the change of expression of the tolerance for the residues of glyphosate (N-(phosphonomethyl)glycine) resulting from the application of glyphosate, the isopropylamine salt of glyphosate and/or the monoammonium salt of glyphosate in or on the food commodities:

| Crop Group#<br>or Subgroup # | Crop Group/Subgroup Tolerance Expression  | Parts per<br>Million |
|------------------------------|---|----------------------|
| 01                           | Vegetable Root and Tuber, Group (Except sugar beet)(Rep crops-carrot, potato, radish, ) ●                 | 0.2                  |
| 02                           | Vegetable, Leaves of Root and Tuber, Group (except sugar beet tops)(Rep crops-Turnip and garden beet )●   | 0.2                  |
| 03                           | Vegetable, Bulb, Group ●(Rep crops-Onion, green; and onion, dry bulb)                                     | 0.2                  |
| 04                           | Vegetable, Leafy, Except Brassica, Group ●(Rep crops-celery, head lettuce, leaf lettuce, and spinach)     | 0.2                  |
| 05                           | Vegetable, Brassica, Leafy, Group ● (Rep crops-broccoli or cauliflower; cabbage; and mustard greens)      | 0.2                  |
| 06                           | Vegetable, Legume, Group● (except soybean) (Rep crops- beans succulent and dry and pea succulent and dry) | 5.0                  |
| 07                           | Vegetable, Foliage of Legume, Group●(Except soybean forage and hay)(Rep crops-bean and field pea)         | 0.2                  |
| 08                           | Vegetable, Fruiting, Group●(Rep crops-Tomato, bell pepper, non-bell pepper)                               | 0.1                  |
| 09                           | Vegetable, Cucurbit, Group●(Rep crop-Cucumber, muskmelon, and summer squash)                              | 0.5                  |
| 10                           | Fruit, Citrus, Group ●(Rep crops-Sweet orange, lemon, and grapefruit)                                     | 0.5                  |

● Existing tolerances, with the newest expression for that group.





The petitioner also requests the deletion of the tolerance for the residues of glyphosate (N-(phosphonomethyl)glycine) resulting from the application of the isopropylamine salt of glyphosate and/or the monoammonium salt of glyphosate in or on the raw agricultural commodity groups:

| Crop/Crop Group/Subgroup Tolerance Expression | Parts per Million |
|---|-------------------|
| Acerola                                       | 0.2               |
| Alfalfa                                       | 200               |
| Alfalfa, forage                               | 75                |
| Alfalfa, fresh and hay                        | 0.2               |
| Alfalfa, hay                                  | 200               |
| Almonds, hulls                                | 1                 |
| Artichokes, Jerusalem                         | 0.2               |
| Legume, forage (except soybean and peanuts)   | 0.4               |
| Bahiagrass                                    | 200               |
| Beets   | 0.2               |
| Bermudagrass                                  | 200               |
| Bluegrass                                     | 200               |
| Bromegrass                                    | 200               |
| Carambola                                     | 0.2               |
| Carrots                                       | 0.2               |
| Celeriac                                      | 0.2               |
| Chickory                                      | 0.2               |
| Citrus, fruits                                | 0.5               |
| Clover  | 200               |
| Cocoa beans                                   | 0.2               |
| Fescue  | 200               |
| Forage grasses                                | 0.2               |

| Crop/Crop Group/Subgroup Tolerance Expression                  | Parts per Million |
|--|-------------------|
| Fruits, small, and berries                                     | 0.2               |
| Genip  | 0.2               |
| Horseradish  | 0.2               |
| Leafy vegetables   | 0.2               |
| Legume Vegetables (Succulent and dried) group(Except soybeans) | 5.0               |
| Nuts   | 0.2               |
| Olives, Imported   | 0.1               |
| Orchardgrass   | 200               |
| Parsnips   | 0.2               |
| Pistachio  | 0.2               |
| Pome fruits  | 0.2               |
| Potatoes   | 0.2               |
| Radishes   | 0.2               |
| Rutabagas  | 0.2               |
| Ryegrass   | 200               |
| Seed and pod vegetables  | 0.2 (N)           |
| Seed and pod vegetables, forage                                | 0.2 (N)           |
| Seed and pod vegetables, hay                                   | 0.2 (N)           |
| Salisfy  | 0.2               |
| Soybeans, Grain  | 20                |
| Sweet potatoes   | 0.2               |
| Timothy  | 200               |
| Turnips  | 0.2               |
| Vegetables, bulb   | 0.2               |
| Vegetables, cucurbit   | 0.5               |
| Vegetables, fruiting (except cucurbits) group                  | 0.1               |

|                                    |     |
|------------------------------------|-----|
| Vegetables, leafy, Brassica (cole) | 0.2 |
| Wheatgrass                         | 200 |
| Yams                               | 0.2 |

**SUMMARY TABLE** -This table is a compilation of the new additions, new expressions and deletions presented in the previous three tables and is intended to be the manner in which the updated list of tolerances is to be published.

**§ 180.364 Glyphosate: tolerances for residues.**

(a) *General.* Tolerances are established for the residues of glyphosate(N-(phosphonomethyl)glycine) resulting from the application of glyphosate, the isopropylamine salt of glyphosate and/or the monoammonium salt of glyphosate in or on the following food commodities:

| Commodity                    | Parts per million |
|------------------------------|-------------------|
| Almond hulls                 | 25                |
| Aloe vera                    | 0.5               |
| Animal Feed, Nongrass, Group | 200               |
| Ambarella                    | 0.2               |
| Artichoke, globe             | 0.2               |
| Asparagus                    | 0.5               |
| Aspirated grain fractions    | 200               |
| Atemoya                      | 0.2               |
| Avocados                     | 0.2               |
| Barley, bran                 | 30                |
| Barley, grain                | 20                |
| Bamboo, shoots               | 0.2               |
| Bananas                      | 0.2               |
| Barbados cherry              | 0.2               |
| Berry Group                  | 0.2               |
| Beets, sugar, dried pulp     | 25                |
| Beets, sugar, roots          | 10                |
| Beets, sugar, tops           | 10                |
| Biriba                       | 0.2               |

| Commodity              | Parts per million |
|------------------------|-------------------|
| Betelnut               | 1.0               |
| Blimbe                 | 0.2               |
| Borage, seed           | 0.1               |
| Breadfruit             | 0.2               |
| Cacao bean             | 0.2               |
| Cactus, fruit          | 0.5               |
| Cactus, pads           | 0.5               |
| Canistel               | 0.2               |
| Canola meal            | 15                |
| Canola seed            | 10                |
| Cattle , kidney        | 4.0               |
| Cattle, liver          | 0.5               |
| Chaya                  | 1.0               |
| Cherimoya              | 0.2               |
| Citrus, pulp, dried    | 1.5               |
| Cotton gin by-products | 100               |
| Coconut                | 0.1               |
| Coffee bean            | 1                 |
| Corn, field, forage    | 1                 |
| Corn, field, grain     | 1                 |
| Corn, field, stover    | 100               |
| Cottonseed             | 15                |
| Cranberries            | 0.2               |
| Crambe, seed           | 0.1               |
| Custard apple          | 0.2               |

| Commodity   | Parts per million |
|---|-------------------|
| Dates   | 0.2               |
| Dokudami  | 2.0               |
| Durian  | 0.2               |
| Epazote   | 1.3               |
| Feijoa  | 0.2               |
| Fig   | 0.2               |
| Fish  | 0.25              |
| Fruit, Citrus, Group  | 0.5               |
| Fruit, Pome, Group  | 0.2               |
| Fruit, Stone, Group   | 0.2               |
| Flax, seed  | 0.1               |
| Galangal, roots   | 0.2               |
| Ginger, white, flower   | 0.2               |
| Gourd, buffalo, seed  | 0.1               |
| Goats, kidney   | 4.0               |
| Goats, liver  | 0.5               |
| Governor's Plum   | 0.2               |
| Gow Kee, leaves   | 0.2               |
| Grain, Cereal Group(except barley, corn, grain sorghum, oats and wheat)         | 0.1               |
| Grain, Cereal, Forage, Fodder, and Straw, Group(Except corn, sorghum and wheat) | 100               |
| Grapes  | 0.2               |
| Grass, Forage, Fodder and Hay, Group  | 200               |
| Guavas  | 0.2               |
| Herb subgroup   | 0.2               |





| Commodity                 | Parts per million |
|---------------------------|-------------------|
| Meadowfoam, seed          | 0.1               |
| Mioga, flower             | 0.2               |
| Mustard, seed             | 0.1               |
| Nut, Tree, Group          | 1                 |
| Oats, grain               | 20                |
| Okra                      | 0.5               |
| Olives                    | 0.2               |
| Oregano, Mexican, leaves  | 2.0               |
| Palm, heart, leaves       | 0.2               |
| Palm oil                  | 0.1               |
| Papaya                    | 0.2               |
| Papaya, mountain          | 0.2               |
| Passion fruit             | 0.2               |
| Pawpaw                    | 0.2               |
| Peanut, forage            | 0.5               |
| Peanut, hay               | 0.5               |
| Peanuts                   | 0.1               |
| Pepper leaf, fresh leaves | 0.2               |
| Peppermint                | 200               |
| Perilla, tops             | 1.8               |
| Persimmon                 | 0.2               |
| Pineapple                 | 0.1               |
| Pine nut                  | 1.0               |
| Pistachio                 | 1.0               |
| Pomegranate               | 0.2               |

| Commodity                           | Parts per million |
|-------------------------------------|-------------------|
| Poultry, kidney                     | 0.5               |
| Poultry, liver                      | 0.5               |
| Pulasan                             | 0.2               |
| Quinoa, grain                       | 5                 |
| Rambutan                            | 0.2               |
| Rapeseed, seed                      | 10                |
| Rapeseed meal                       | 15                |
| Safflower, seed                     | 0.1               |
| Salal                               | 0.2               |
| Sapodilla                           | 0.2               |
| Sapote, black                       | 0.2               |
| Sapote, white                       | 0.2               |
| Sesame, seed                        | 0.1               |
| Sheep, kidney                       | 4                 |
| Sheep, liver                        | 0.5               |
| Shellfish                           | 3                 |
| Sorghum, grain                      | 15                |
| Sorghum, grain, stover              | 40                |
| Soursop                             | 0.2               |
| Soybean, hulls                      | 100               |
| Soybeans, aspirated grain fractions | 50                |
| Soybeans, forage                    | 100               |
| Soybean                             | 20                |
| Soybeans, hay                       | 200               |
| Spanish lime                        | 0.2               |

| Commodity  | Parts per million |
|--|-------------------|
| Spearmint  | 200               |
| Spice subgroup   | 7.0               |
| Star apple   | 0.2               |
| Starfruit  | 0.2               |
| Stevia, dried leaves   | 1.0               |
| Strawberry   | 0.2               |
| Sugar apple  | 0.2               |
| Sugarcane  | 2.0               |
| Sugarcane, molasses  | 30                |
| Sunflower seed   | 0.1               |
| Surinam cherry   | 0.2               |
| Tamarind   | 0.2               |
| Tea, dried   | 1                 |
| Tea, instant   | 7                 |
| Teff, grain  | 5                 |
| Ti, leaves   | 0.2               |
| Ti, roots  | 0.2               |
| Ugli fruit   | 0.5               |
| Vegetable, Root and Tuber, Group<br>(except sugar beets)               | 0.2               |
| Vegetable, Leaves of Root and Tuber,<br>Group (except sugar beet tops) | 0.2               |
| Vegetable, Bulb, Group   | 0.2               |
| Vegetable, Leafy, Except Brassica,<br>Group                            | 0.2               |
| Vegetable, Brassica, Leafy, Group                                      | 0.2               |

| Commodity   | Parts per million |
|---|-------------------|
| Vegetable, Legume, Group (except soybeans)                          | 5.0               |
| Vegetable, Foliage of Legume, Group (except soybean forage and hay) | 0.2               |
| Vegetable, Fruiting, Group  | 0.1               |
| Vegetable, Cucurbit, Group  | 0.5               |
| Wasabi, roots   | 0.2               |
| Water spinach, tops   | 0.2               |
| Watercress, upland  | 0.2               |
| Wheat, grain  | 5                 |
| Wheat Milling Fractions (excluding flour)                           | 20                |
| Wheat, straw  | 85                |
| Yacon, tuber  | 0.2               |

SECTION G

REASONABLE GROUNDS IN SUPPORT OF OUR PETITION  
FOR GLYPHOSATE ON ORCHARD TYPE CROPS AND  
OTHER FOOD CROPS

## Section G

The IR-4 Project received requests from Florida, California, Texas, North Dakota, and New Jersey for the clearance of glyphosate in/on numerous crops such as coriander, prickly pear cactus, safflower, peach, aloe vera, annual canarygrass, crambe and flax (requests follow this section). Glyphosate is needed for general weed control in these crops as there is no economical alternative available for these use patterns.

Applications of glyphosate in Orchard Type Crops would consist of general weed control, preplant (site preparation), strips (in row), chemical mowing and middles (between rows). Applications of glyphosate in All Other Food Crops would consist of chemical fallow, preplant fallow beds, preplant, preemergence, and postharvest. All of these applications would control a broad spectrum of weeds. Briefly, EPA has an adequate data base concerning the residues of glyphosate in crops similar to Orchard Type Crops and Other Food Crops. Due to the data base available to EPA on glyphosate's fate in tree fruits, it is reasonable to establish the tolerances requested in Section F.

At the moment, there are very few tools available to combat insect, disease and weed problems in minor crops. This lack of crop protection tools severely limits production and potential expansion of minor crops, especially the ultra minor crops like herbs, spices and medicinals. Progress in the development of residue data has been slow due to the time and expense of generating data on each of the numerous commodities. With improved production, the projections for expansion of minor crops is good. For example, there has been increased interest in medicinal crops.

Glyphosate is a postemergence systemic herbicide with no residual activity. It is generally non-selective and gives broad spectrum control of many annual and perennial weeds. Glyphosate moves through the plant from the point of foliage contact to and into the root system. Visible effects on most annual weeds occurs within 2 to 4 days, but on most perennial weeds may not occur for 7 days or more. Extremely cool or cloudy weather following treatment may slow activity of this product and delay development of visual symptoms. Visible effects are a gradual wilting and yellowing of the plant which advances to complete browning of above-ground growth and deterioration of underground plant parts.

Weeds must be emerged at the time of application to be controlled by this product. Weeds germinating from seed after application will not be controlled. Unemerged plants from unattached underground rhizomes or root stocks of perennials will not be affected by the herbicide and continue to grow.

As glyphosate is already registered on most major and minor commodities, the daily consumption of these crops is relatively limited and would probably qualify as Low Dietary Intake (LDI) crops under the EPA definition, FR:Vol 51, No. 63, pp 11341-11346, although since these are general crop groups rather than specific commodities,

they would not be specified on the list.

As shown in 40 CFR 180.364, tolerances exist for a number of crops similar to Orchard Type Crops such as tree fruits, tree nuts, tropical crops, and vine crops. Tolerances also exist in crops similar to All Other Food Crops such as asparagus, cereal crops, corn, grain sorghum, peanuts, and vegetable crops. Glyphosate has been reviewed under FQPA with recent tolerances on Tropical Crops in EPA Rule, FR:Vol 63, No. 195 pg. 54058-54066. Sections A and B demonstrate that the proposed application methods of glyphosate in Orchard Type Crops and All Other Food Crops will be similar to existing methods. Therefore, no additional data should be needed in order to establish a tolerance for Orchard Type Crops and Other Food Crops. Establishing the tolerances (Section F) for glyphosate in/on Orchard Type Crops and Other Food Crops are appropriate and will not expose animals, man or the environment to unreasonable adverse effects.

## Risk Assessment and Statutory Findings

### Glyphosate uses.

- 1 Glyphosate is a post-emergent, systemic herbicide with no residual soil activity. It is generally non-selective and provides broad spectrum control of many annual weeds, perennial weeds, woody brush and trees. Glyphosate is registered for a variety of agricultural uses, including pre-plant, preharvest, in-crop, fallow, reduced tillage, forestry and aquatic applications, as well as non-crop applications. When applied at lower rates, glyphosate also acts as a plant growth regulator. Glyphosate's primary mode of action is inhibition of the biosynthesis of aromatic amino acids in plants.

#### a. Toxicological Profile

- i. Safety. Monsanto Company has submitted numerous toxicology studies in support of glyphosate. According to Monsanto Company, the acute toxicity and irritation potential of glyphosate is low. There are large margins of safety for sub-chronic and chronic effects. Glyphosate does not produce reproductive effects and is not a teratogen, mutagen, carcinogen or a neurotoxin. Risk assessment calculations indicate the margin of safety for agricultural workers and the population in general far exceed the EPA required level of 100. The following mammalian toxicity studies have been conducted to support glyphosate:

- (1) A rat acute oral study with a combined LD<INF>50 of

- >5,000 mg/kg.
- (2) A rabbit acute dermal LD<sub>50</sub> of > 5,000 mg/kg.
  - (3) A primary eye irritation study in the rabbit which showed severe irritation for glyphosate acid. However, glyphosate is normally formulated as one of several salts and eye irritation studies on the salts showed essentially no irritation.
  - (4) A primary dermal irritation study which showed essentially no irritation.
  - (5) A primary dermal sensitization study which showed no sensitization.
  - (6) A 90-day feeding study in rats fed dosage levels of 0, 1,000, 5,000 and 20,000 ppm with a no-observable-effect level (NOEL) of 20,000 ppm based on no effects even at the highest dose tested.
  - (7) A 90-day feeding study in mice fed dosage levels of 0, 5,000, 10,000 and 50,000 with a NOEL of 10,000 ppm based on body weight effects at the high dose.
  - (8) A 90-day feeding study in dogs given glyphosate, via capsule, at doses of 0, 200, 600 and 2000 mg/kg/day with a NOEL of 2000 mg/kg/day based on no effects even at the highest dose tested.
  - (9) A 12-month oral study in dogs given glyphosate, via capsule, at doses of 0, 20, 100 and 500 mg/kg/day with a NOEL of 500 mg/kg/day based on no adverse effects at any dose level.
  - (10) A 26-month chronic/feeding oncogenicity study with rats fed dosage levels of 0, 3, 10 and 31 mg/kg/day (males) and 0, 3, 11 and 34 mg/kg/day (females) with a systemic NOEL of 31 mg/kg/day (males) and 34 mg/kg/day (females) based on no carcinogenic or other adverse effects at any dose level.
  - (11) A 24-month chronic/feeding oncogenicity study with rats fed dosage levels of 0, 89, 362 and 940 mg/kg/day (males) and 0, 113, 457 and 1,183 mg/kg/day (females) with a systemic NOEL of 362 mg/kg/day based on body weight effects in the female and eye effects in males. There was no carcinogenic response at any dose level.
  - (12) A mouse oncogenicity study with mice fed dosage levels of 0, 150, 750 and 4,500 mg/kg/day with a NOEL of 750 mg/kg/day based on body weight effects and microscopic liver changes at the high dose. There was no carcinogenic effect at the highest dose tested of 4,500 mg/kg/day.
  - (13) An oral developmental toxicity study with rats given doses of 0, 300, 1,000 and 3,500 mg/kg/day with a maternal NOEL of 1,000 mg/kg/day based on clinical signs of toxicity, body weight effects and mortality, and a fetal NOEL of 1,000 mg/kg/day based on reduced body weights and delayed



sternbrae maturation at the highest dose tested of 3,500 mg/kg/day.

- (14) An oral developmental toxicity study with rabbits given doses of 0, 75, 175 and 350 mg/kg/day with a maternal of NOEL of 175 mg/kg/day based on clinical signs of toxicity and mortality, and a fetal NOEL of 350 mg/kg/day based on no developmental toxicity at any dose tested.
  - (15) A three-generation reproduction study with rats fed dosage levels of 0, 3, 10 and 30 mg/kg/day with a NOEL for systemic and reproductive/developmental parameters of 30 mg/kg/day based on no adverse effects noted at any dose level.
  - (16) A two-generation reproduction study with rats fed dosage levels of 0, 100, 500 and 1,500 mg/kg/day with a NOEL for systemic and developmental parameters of 500 mg/kg/day based on body weight effects, clinical signs of toxicity in adult animals and decreased pup body weights, and a reproductive NOEL of 1,500 mg/kg/day.
  - (17) A number of mutagenicity studies were conducted and were all negative. These studies included: chromosomal aberration in vitro (no aberrations in Chinese hamster ovary cells were caused with or without S9 activation); DNA repair in rat hepatocyte; in vivo bone marrow cytogenic test in rats; rec-assay with *B. subtilis*; reverse mutation test with *S. typhimurium*; Ames test with *S. typhimurium*; and dominant-lethal mutagenicity test in mice.
- ii. Threshold effects-- chronic effects. The reference dose (RfD) for glyphosate based on maternal effects in a developmental study with rabbits (NOEL of 175 mg/kg bwt/day) and using a hundred-fold safety factor is calculated to be 2.0 mg/kg body weight/day. Acute toxicity. Based on the available acute toxicity data, glyphosate does not pose any acute dietary risks.
- iii. Non-threshold effects--carcinogenicity. The Health Effects Division Carcinogenicity Peer Review Committee has classified glyphosate in Group E (evidence of non-carcinogenicity for humans) based upon lack of convincing carcinogenicity evidence in adequate studies in two animal species. There was no evidence of carcinogenicity in an 18-month feeding study in mice and a 2-year feeding study in rats at the dosage levels tested. The doses tested are adequate for identifying a cancer risk. Thus, a cancer risk assessment is not appropriate.
- iv. Aggregate exposure. For purposes of assessing the potential dietary

exposure, Monsanto has estimated aggregate exposure based on the tolerances for glyphosate on most crops similar to Orchard Type Crops and Other Food Crops, and has established 0.2 ppm tolerances. Since all of the major crops similar to Orchard Type Crops and Other Food Crops are already registered, and the consumption of crops from these groups is so limited, the theoretical maximum residue contribution (TMRC) would be limited. Other potential sources of exposure of the general population to residues of pesticides are residues in drinking water and exposure from non-occupational sources. A Maximum Concentration Level (MCL) has been established for residues of glyphosate in drinking water at 0.7 mg/l since glyphosate is approved for direct application to water. The MCL represents the level at which no known or anticipated adverse health effects occur, allowing for an adequate margin of safety based on the reference dose (RfD). Non-occupational exposure to glyphosate is expected based on the currently-registered uses; however, due to the low acute toxicity and lack of other toxicological concerns, the risk posed by non-occupational exposure to glyphosate is minimal. Monsanto believes that EPA consideration of a common mechanism of toxicity is not appropriate at this time since Monsanto believes that EPA does not have information to indicate that toxic effects produced by glyphosate would be cumulative with those of any other chemical compound.

b. Determination of safety for U.S. population. RfD: The theoretical maximum residue contribution (TMRC) for existing, published tolerances for glyphosate is 0.029960 mg/kg bw/day or 1.5 percent of the RfD for the overall U.S. population. Even using the conservative exposure assumptions described above and substituting the more widely consumed crops, there is not enough exposure to calculate a significant contribution to the TMRC. As the exposure from the additional crops posed here would be even less, the aggregate exposure of these crops will not add to the RfD for the overall U.S. population. EPA generally has no concern for exposures below 100 percent of the RfD. EPA has concluded that aggregate exposure to glyphosate from food will utilize 1.5% of the RfD for the U.S. population. The major identifiable subgroup with the highest aggregate exposure is non-nursing infants (less than 1 year) and children (1-6) as discussed below. EPA generally has no concern for exposures below 100% of the RfD because the RfD represents the level at or below which daily aggregate dietary exposure over a lifetime will not pose appreciable risks to human health. Therefore, based on the completeness and reliability of the toxicity data and the conservative exposure assessment, Monsanto concludes that there is a reasonable certainty that no harm will result from aggregate exposure to residues of glyphosate, including all anticipated dietary exposures and all other non-occupational exposures.

c. Determination of safety for infants and children. In assessing the potential for additional sensitivity of infants and children to residues of glyphosate, data were considered from developmental toxicity studies in the rat and rabbit and multi-generation reproduction studies in rats. No birth defects were observed in the offspring of rats given glyphosate by gavage at dose levels of 0, 300, 1,000, and 3,500 mg/kg/day on days 6 through 19 of gestation. The NOEL for this study was 1,000 mg/kg/day based on maternal and developmental toxicity observed at the highest dose tested, 3,500 mg/kg/day. The high-dose in this study was 3.5 times higher than the limit dose that is currently required by the guidelines. No birth defects were observed in the offspring of rabbits given glyphosate by gavage at dose levels of 0, 75, 175, and 350 mg/kg/day on days 6 through 27 of gestation. The NOEL for this study is considered to be 175 mg/kg/day based on maternal toxicity at the high-dose of 350 mg/kg/day. Because no developmental toxicity was observed at any dose level, the developmental NOEL is considered to be 350 mg/kg/day.

Male and female rats were fed glyphosate at dose levels of 0, 3, 10, and 30 mg/kg/day every day throughout the production of three successive generations. No adverse treatment-related effects on reproduction were observed. Because no toxicity was noted even at the highest dose tested, a second reproduction study at higher dose levels was performed and is described below.

Male and female rats were fed glyphosate at dose levels of 0, 100, 500, and 1,500 mg/kg/day every day throughout the production of two successive generations. Reduced body weights and soft stools occurred at 1,500 mg/kg/day (3 percent of the diet); therefore, the systemic NOEL is considered to be 500 mg/kg/day. Glyphosate did not affect the ability of rats to mate, conceive, carry or deliver normal offspring at any dose level.

The results of these studies indicate that glyphosate does not produce birth defects and is not a reproductive toxin. The TMRC for existing, published tolerances for glyphosate are 0.026051 or 1.3 % for nursing infants (less than 1 year old), 0.065430 or 3.3 % of the RfD for non-nursing infants less than 1 year old; 0.064388 or 3.2% of the RfD for children (1-6 years old); 0.043017 or 2.2 % of the RfD for children (7-12 years old); 0.030928 or 1.5% of the RfD for females (13+/-nursing); 0.030241 or 1.5% of the RfD for non-Hispanic whites; and 0.030206 or 1.5% of the RfD for non-Hispanic blacks. EPA generally has no concern for exposures below 100 percent of the RfD. Therefore, based on the completeness and reliability of the toxicity data and the conservative exposure assessment, Monsanto concludes that there is a reasonable certainty that no harm will result from aggregate exposure to residues of glyphosate, including all anticipated dietary exposures and all other non-occupational exposures.

d. Estrogenic effects. The toxicity studies required by EPA for the registration of pesticides measure numerous endpoints with sufficient sensitivity to detect potential endocrine-modulating activity. No effects have been identified in sub-chronic, chronic or developmental toxicity studies to indicate any endocrine-modulating activity by glyphosate. In addition, negative results were obtained when glyphosate was tested in a dominant-lethal mutation assay. While this assay was designed as a genetic toxicity test, agents that can affect male reproduction

function will also cause effects in this assay. More importantly, the multi-generation reproduction study in rodents is a complex study design which measures a broad range of endpoints in the reproductive system and in developing offspring that are sensitive to alterations by chemical agents. Glyphosate has been tested in two separate multi-generation studies and each time the results demonstrated that glyphosate is not a reproductive toxin.

#### Other Considerations

e. Chemical residue. The nature of the residue in plants and animals is adequately understood. The residue to be regulated is the parent glyphosate. The submitted information adequately support the proposed tolerances of 0.2 ppm. Although no residue data are included in this petition for these crops, extensive experience and data with glyphosate in/on similar crop groups, little or no detectable residues of the herbicide are recovered in the harvested portion. It is reasonable and logical to expect little or no detectable residues of glyphosate in these crop groups when glyphosate is applied in a similar manner. Tolerances for the combined residues of glyphosate and its metabolite, AMPA, have been established at 0.2 ppm on a number crops similar to 'Orchard Type Crops' (tree fruit, nuts, small fruits and berries, vine crops, and tropical fruit. Codex maximum residue levels (MRLs) have not been established for residues of glyphosate on durian, mangosteen and rambutan. Any secondary residues occurring in milk, eggs, meat, fat, liver and kidney of cattle, goats, horses, hogs, poultry and sheep are covered by existing tolerances. There is a practical analytical method for detecting and measuring levels of glyphosate in or on food with a limit of detection (0.05 ppm) that allows monitoring of food with residues at or above the levels set in these tolerances. EPA has provided information on this method to FDA. This method is available to anyone who is interested in pesticide residue enforcement from the Field Operations Division, Office of Pesticide Programs.

f. Environmental fate. Glyphosate adsorbs strongly to soil and is not expected to move vertically below the 6-inch soil layer; residues are expected to be immobile in soil. Glyphosate is readily degraded by soil microbes to AMPA, which is degraded to carbon dioxide. Glyphosate and AMPA are not likely to move to ground water due to their strong adsorptive characteristics. However, due to its aquatic use patterns and through erosion, glyphosate does have the potential to enter surface waters, where it will adsorb to sediment and undergo microbial degradation. Glyphosate is no more than slightly toxic to birds and is practically non-toxic to fish, aquatic invertebrates and honeybees.

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| .....           | Rev. 9/85                |

MINOR USE  
PESTICIDE CLEARANCE REQUEST FORM

OFFICE USE  
00: 8 1987 3554  
Date Rec'd. PR No.

1. Requestor (Name/Address/Phone):  
W M Stall  
1243 F. Field Blvd  
Univ. of FL  
Gainesville FL 32611 904-392-7913
2. Chemical Needed (Std Name/Trade Name/Mfg):  
~~Ortho Phosphate~~ Roundup MONS
3. Site/Commodity: ~~ECOTON~~
4. Where Needed (Field, Greenhouse, Water, etc.): Field
5. Parts Consumed-Including By-Products (Where Appropriate): Leaf
6. Reason for Need (Pests, etc.): Annual & Perennial Weeds
7. Alternative Treatments (Advantages/Disadvantages): None
8. Importance of Proposed Use (Acres, Economics, etc.):
9. Proposed Labeling:  
Formulation:  
Dosage Rate (Active Ingredient):  
Method of Application (Ground, Air, etc.): ground  
Directions for Use (Timing, No. Appl., Frequency, etc.): 1x plant emergence  
Limitations (Harvest Interval, etc.):  
Special Safety Precautions (if any):
10. Other Interested States/Agencies: PR 035-84 - JOHN
11. Comments: Same as for PR #3554
12. Submitted by: Name, Signature, Date: W M Stall 9/29/87

IR-4 Project, Cook College, Rutgers University  
P.O. Box 231, New Brunswick, NJ 08903 Ph: 201-932-9575  
NOTE: Use Reverse Side for Additional Information

J. H. H.  
T. H. H.  
10/1/87

AUG 17 1987

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Requestor ☐

☐ Rev.  
☐ 9/85

MINOR USE

## PESTICIDE CLEARANCE REQUEST FORM

9/87 OFFICE USE 3554  
Date Rec'd. PR No.

1. Requestor (Name/Address/Phone):

Ratto Bros.

Richard Smith

6312 Beckwith Rd.

U.C. Cooperative Extension

Modesto, CA 95351

733 County Center3 Ct.

(209) 545-4445

Modesto, CA 95355 (209)571-6654

2. Chemical Needed (Std Name/Trade Name/Mfg): ROUNDUP :Monsanto Company, Agricultural Products,  
St. Louis, Missouri, 63167

3. Site/Commodity: Cilantro (Coriander)

4. Where Needed (Field, Greenhouse, Water, etc.): Field

5. Parts Consumed-Including By-Products (Where Appropriate): Leaves; product is washed before sent to market.

6. Reason for Need (Pests, etc.): Control of: Annual and perennial weeds. Milkweed  
(*Asclepias syriaca*), Pigweed (*Amaranthus retroflexus*), Johnsongrass (*Sorghum halepense*)

7. Alternative Treatments (Advantages/Disadvantages): VAPAM: can be used but has shown to be ineffective in controlling these weeds. High cost to Hand Hoe.

8. Importance of Proposed Use (Acres, Economics, etc.): 50 ac./yr. planted at estimated Gross value of \$3000/ac. Possible 100% loss if severe weed problem. Cost to hand hoe? Average weed problem; \$500/ac. Severe; \$1600/ac.

**9. Proposed Labeling:**

Formulation: Brandum

Dosage Rate (Active Ingredient): Isopropylamine salt of glyphosate....41.0%

Method of Application (Ground, Air, etc.): Ground spray

Directions for Use (Timing, No. Appl., Frequency, etc.): Apply as directed on existing label;  
According to "CROPPING SYSTEM SECTIONS" for specific recommended use.

Refer to "Fallow and Reduced Tillage Systems".

Limitations (Harvest Interval, etc.): Extreme care must be taken to avoid contact of spray with foliage, green stems, or fruit of desirable crops.

Special Safety Precautions (if any):

**10. Other Interested States/Agencies:**

11. Comments: Winter weed control on prepared seedbeds with ROTENONE will be an extremely effective practice to lower the amount of weed seeds that can germinate without disturbing the seedbed.

12. Submitted by: Name, Signature, Date

Farm Advisor

IR-4 Project, Cook College, Rutgers University  
P.O. Box 231, New Brunswick, NJ 08903 Ph: 201-932-9575

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 MINOR USE  
 PESTICIDE CLEARANCE REQUEST FORM

 OFFICE USE  
 12/89 4062  
 Date Rec'd.

 1. Requestor (Name/Address/Phone): Dr. Peter Folken  
Campus Box 218, Texas A+I Univ, Kingsville TX  
78363

 2. Chemical Needed (Std Name/Trade Name/Mfg): Tebuthiuron + glyphosate

 3. Site/Commodity: Prickly pear cactus in fruit, vegetables + forage

 4. Where Needed (Field, Greenhouse, Water, etc.): Experimental plantings; pilot scale (10-50 acre fields) for commercial production

 5. Parts Consumed-Including By-Products (Where Appropriate): cladodes (vegetables) + humus  
cladodes - for cattle, fruits for humans

 6. Reason for Need (Pests, etc.): weed control

 7. Alternative Treatments (Advantages/Disadvantages): doing manual weeding - herbicides more cost effective

 8. Importance of Proposed Use (Acres, Economics, etc.): 300 acres of prickly pear in California nets \$3 million dollars. Market could be ten of millions of dollars

## 9. Proposed Labeling:

Formulation:

Tebuthiuron  
20% w/wGlyphosate  
standard

Dosage Rate (Active Ingredient):

2-4 lb a.i./acre

2%  
2%

Method of Application (Ground, Air, etc.):

Ground

ground + backpack

Directions for Use (Timing, No. Appl., Frequency, etc.):

1X or 2X/year

as needed to  
control weeds  
+ bermuda grass
 Limitations (Harvest Interval, etc.): can apply any time to minimize residues

 No limitations on  
date of application

Special Safety Precautions (if any):

## 10. Other Interested States/Agencies:

Texas Prickly Pear  
Local Congressmen
Texas Dept of Agriculture

## 11. Comments:

## 12. Submitted by: Name, Signature, Date

Peter Folken
Permuted 11/1/89

 IR-4 Project, Cook College, Rutgers University  
 P.O. Box 231, New Brunswick, NJ 08903 Ph: 201-932-9575  
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MINOR USE

PESTICIDE CLEARANCE REQUEST FORM

OFFICE USE  
1/28/91 4062  
Date Rec'd. P.P.S.

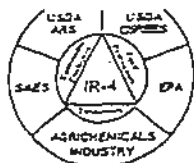
1. Requestor (Name/Address/Phone): HARRY S. AGAMAHIAN  
UNIV. of CALIF. Coop Ext.  
118 WILGART WAY  
SALINAS, CA. 93901

2. Chemical Needed (Std Name/Trade Name/Mfg): glyphosate/ROUNDUP  
MUNSAMTO COMPANY
3. Site/Commodity: PRICKLY PEAR CACTUS; Fruit (PEARS) AND PADS  
COMMERCIAL PLANTINGS APPROX. 300 ACRES.
4. Where Needed (Field, Greenhouse, Water, etc.): Field: commercial plantings
5. Parts Consumed-Including By-Products (Where Appropriate): PEARS, Vegetative PADS
6. Reason for Need (Pests, etc.): NO CURRENTLY REGISTERED Herbicide TO  
CONTROL ANNUAL WEEDS
7. Alternative Treatments (Advantages/Disadvantages): HAND HOING, MECHANICAL  
CULTIVATION. AS THE PLANTS INCREASE IN SIZE ONLY HAND HOING
8. Importance of Proposed Use (Acres, Economics, etc.): COMMERCIAL PLANTINGS  
300 ACRES. Some small plantings of 1-2 ac size  
would use hand sprayers
9. Proposed Labeling:  
Formulation: 4 lb/gallon Emulsifiable Liquid  
Dosage Rate (Active Ingredient): 2-4 lb/A.  
Method of Application (Ground, Air, etc.): GROUND, DIRECTED SPRAY TO  
BASEL PORTION OF THE CACTUS PLANT  
Directions for Use (Timing, No. Appl., Frequency, etc.): ONE TO TWO APPLICATIONS  
PER SEASON OR AS NEEDED, RESTRICTED TO 10 lb/A  
OR 10 lb/A. active ingredient per season.  
Limitations (Harvest Interval, etc.): 21 day pre HARVEST INTERVAL  
Special Safety Precautions (if any): DO NOT GET IN EYES, ON SKIN OR CLOTHING
10. Other Interested States/Agencies: TEXAS Dept. of Agriculture
11. Comments: TEXAS A&I UNIVERSITY  
CALIFORNIA DATA. NEEDED ARE CACTUS SAFETY AND RESIDUE  
SAMPLES OF PEARS AND VEGETATIVE PADS.
12. Submitted by: Name, Signature, Date Harry S. Agamahian 2/28/90

IR-4 Project, Cook College, Rutgers University  
P.O. Box 231, New Brunswick, NJ 08903 Ph: 201-932-9575  
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1/3/91





## IR-4 Minor Use Pesticide Clearance Request Form

FOR OFFICE USE ONLY

Date: 10/95 6/20  
Cal.: 6/20 PR. #

1. Requester:

Name: NEIL RIVELAND Affiliation: NDSD/NORTH DAKOTA STATE UNIV.  
Address: NDSD WILLISTON RESEARCH CENTER Box 1445  
City: WILLISTON State: ND Zip: 58801  
Phone: (701) 774-4315 FAX: (701) 572-0544

2. Pesticide: (Common Name/Mfg.): GLYPHOSATE/MONSANTO

3. Commodity: (Complete one form per crop):

Crop: SAFFLOWER  
Use site (field, greenhouse, post-harvest, etc.): PREPLANT OR PREEMERGENCE BURNDOWN  
Parts Consumed: OIL Animal Feed By-Products Yes X No  
Planting Season: Late April to May 20  
Harvest Season: September to early October  
Local Acreage: 25-30000 % National: 10

4. Target Pest(s)/Potential Effects: GRASS AND BROADLEAF WEEDS

5. Why is this use needed?: CONTROL WEEDS PRIOR TO Seeding in a minimum or  
no-till cropping system

6. Proposed Labeling:

Trade Name/Formulation: ROUNDUP / 3 lb a.s./gal SOLUBLE  
Dosage Rate (Active Ingredient/Acre): 0.19 a.s./A - 0.75 lb a.s./A  
Application Parameters: (Type of sprayer, volume range, etc.): GROUND SPRAYER  
Directions for Use (Timing, No. Appl., Frequency, etc.): APPLY BEFORE CROP EMERGES

Limitations (Preharvest interval, total amount of a.i./acre/year):

Special Safety Precautions (If Any):

7. Supporting Data Availability\*: (Check appropriate items):

☐ Phytotoxicity(P) ☐ Pest Control(E) ☐ Yield(Y) ☐ AI(P,E,Y) ☐ Other

\*Preliminary data may be required to support your request.

8. Submitted By:

Name: NEIL RIVELAND Signature: Neil Riveland Date: 10/9/95

See Reverse Side for Directions and  
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IR-4 Project, Cook College, Rutgers University  
P.O. Box 231, New Brunswick, NJ 08903  
Phone (908) 932-9575 • FAX # (908) 932-8481

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Blue - Regional Office  
Green - State Liaison  
Green - Requestor

MINOR USE  
PESTICIDE CLEARANCE REQUEST FOR

OFFICE USE  
8/94 6120  
Date Rec'd RA No.

1. Requestor (Name/Address/Phone): William H. Ahrens / Crop & Weed Sci. Dept. / North Dakota State Univ. / Fargo ND 58105 / Tel 237 8156
2. Chemical Needed (Std Name/Trade Name/Mfg): Glyphosate / Round-Up / Monsanto
3. Site/Commodity: Safflower
4. Where Needed (Field, Greenhouse, Water, etc.): Field
5. Parts Consumed - Including By-products (Where Appropriate): Seeds crushed to produce oil for human consumption.
6. Reason for Need (Pests, etc.): Glyphosate applied preplant or before canola emergence is needed to control existing vegetation in conservation tillage systems.
7. Alternative Treatments (Advantages/Disadvantages):
8. Importance of Proposed Use (Acres, Economics, etc.): 100,000 to 200,000 acres nationwide. Up to 10% of acreage may be treated.
9. Proposed Labelling:  
Formulation: Round-Up 3 lb ae/gal ; Round-Up RT 3 lb ae/gal  
Dosage Rate (Active Ingredient): 0.1875 - 0.75 lb ae/A  
Method of Application (Ground, Air, etc.): Ground or aircraft  
Directions for Use (Timing, No. Appl., Frequency, etc.): Anytime preplant ; anytime before safflower emergence ; no limit on application number or frequency.  
Limitations (Harvest Interval, etc.): Not applicable  
Special Safety Precautions (if any): None.
10. Other Interested States/Agencies: Possibly Montana, Utah, Kansas, Nebraska, Wyoming
11. Comments:
12. Submitted by: Name, Signature, Date William H. Ahrens William H. Ahrens 8/18/94

IR-4 Project, Cook College, Rutgers University, P.O. Box 231, New Brunswick, N.J. 08903 Ph: 201-932-9575

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03/77



## IR-4 Minor Use Pesticide Clearance Request Form

Subm. 295 F7W

FOR OFFICE USE ONLY

Date: 9/7/95 Cal: 06 PR: # 6393  
PRY: 1

1. Requester:

Name: Kurt Hembree Affiliation: UCCE  
Address: 1720 S. Maple Ave  
City: Fresno State: CA Zip: 93702  
Phone: (209) 456-7556 FAX: (209) 456-7575

2. Pesticide: (Common Name/Mfg.): Glyphosate / Monsanto

3. Commodity: (Complete one form per crop):

Crop: Peach  
Use site (field, greenhouse, post-harvest etc.): Field  
Parts Consumed: Fruit Animal Feed By-Products Yes ☐ No ☒  
Planting Season: \_\_\_\_\_  
Harvest Season: June - August  
Local Acreage: \_\_\_\_\_ % National: \_\_\_\_\_

4. Target Pest(s)/Potential Effects: weeds

5. Why is this use needed?: pre harvest cleanup. Shorten the preharvest interval. Weeds interfere with irrigation prior to harvest.

6. Proposed Labeling:

Trade Name/Formulation: Roundup 4AS  
Dosage Rate (Active ingredient/Acre): 1-2 lb ai/A  
Application Parameters: (Type of sprayer, volume range, etc.): low-volume 3-10 gpa or ground sprayer 20-30 gpa (Hooter Sarge R.)  
Directions for Use (Timing, No. Appl., Frequency, etc.): 7 days PHI

Limitations (Preharvest interval, total amount of a.i./acre/year): 7 PHI

Special Safety Precautions (if Any): \_\_\_\_\_

7. Supporting Data Availability: (Check appropriate items):

\_\_\_\_ Phytotoxicity(P) \_\_\_\_ Pest Control(E) \_\_\_\_ Yield(Y) \_\_\_\_ All(P,E,Y) \_\_\_\_ Other

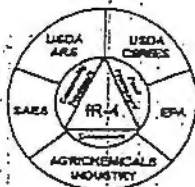
\*Preliminary data may be required to support your request.

8. Submitted By:

Name: Kurt Hembree Signature: Kurt Hembree Date: 9/10/95

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Additional Space for Comments

IR-4 Project, Cook College, Rutgers University  
P.O. Box 231, New Brunswick, NJ 08903  
Phone (908) 932-9575 • FAX # (908) 932-8481



# IR-4 Minor Use Biopesticide Clearance Request Form

352-392-1988

FOR OFFICE USE ONLY

 Date: 10/19/96  
 06 6691  
 BR. #

## 1. Requester:

 Name: Dudley Smith Affiliation: Texas A&M  
 Address: 5011 S. Cooper Street  
 City: College Station State: TX Zip: 77843-2474  
 Phone: 409-845-4702 FAX: 409-845-0456

## 2. Name of Biopesticide and Potential Registrants:

Method of Production (fermentation, in vivo, extraction from plants etc.):

## 3. Commodity: (Complete one form per crop): (Barbadosis)

 Crop: Aliso Vera Use site (field, greenhouse, post-harvest etc.):  
 Parts Consumed: Twice - extracted from leaves Animal Feed By-Products Yes ☐ No ☒  
 Planting Season: Perennial Harvest Season: Summer  
 Local Acreage: 2,000 ac % National: 90

## 4. Target Pest(s)/Potential Effects:

annual perennial weeds

## 5. Why is this use needed? (alternative treatments, advantage/disadvantages)

no weed herbicide available for aliso vera, hand weeding only

## 6. Brief description of proposed study and fund request.

Apply as a post-emergent or over-the-top spray in

## 7. Brief summary of previous studies (Attach copy of data)

## 8. Proposed Labeling:

 Trade Name/Formulation: Round Up or Round Up Plus  
 Dosage Rate (Active Ingredient/Acre): as labeled for grass flgr  
 Application Parameters: (Type of sprayer, volume range, etc.): annual & perennial weeds  
20 gpa  
 Directions for Use (Timing, No. Appl., Frequency, etc.): up to 3 applications per year, as needed, for weed control (Aliso is grown in sub-tropics & weeds grow year-round)  
 Limitations (Preharvest interval, total amount of a.i./acre/year):  
 Special Safety Precautions (If Any):

## 9. Importance of proposed use:

\*Preliminary data may be required to support your request.

## 10. Submitted By:

 Name: Cummins Signature: Cummins Date: 8/22/96

 See Reverse Side for Directions and  
 Additional Space for Comments

 IR-4 Project, Cook College, Rutgers University  
 P.O. Box 231, New Brunswick, N.J. 08903  
 Phone (908) 932-9575 • FAX # (908) 932-8481

MINOR USE  
PESTICIDE CLEARANCE REQUEST FORM

8194 6112  
Date Rec'd OH No.

Requestor (Name/Address/Phone): William H. Ahrens / Crop & Weed Sci. Dept. /  
North Dakota State Univ. / Fargo ND 58105 / 701 237 8156

Chemical Needed (Std Name/Trade Name/Mfg): Glyphosate / Roundup / Monsanto

Site/Commodity: Annual canarygrass

Where Needed (Field, Greenhouse, Water, etc.): Field

Parts Consumed -- Including By-products (Where Appropriate): Used for bird seed.

Reason for Need (Pests, etc.): Glyphosate applied preplant or before canarygrass  
emergence is needed to control existing vegetation in conservation  
tillage systems.

Alternative Treatments (Advantages/Disadvantages): Non-selective broad spectrum alternatives  
are not available.

Importance of Proposed Use (Acres, Economics, etc.): About 5-10 thousand acres nationwide

Proposed Labelling:

Formulation: Roundup 3 lb ae/gal ; Roundup RT 3 lb ae/gal

Dosage Rate (Active Ingredient): 0.1275 - 0.75 lb ae/A

Method of Application (Ground, Air, etc.): Ground or aircraft

Directions for Use (Timing, No. Appl., Frequency, etc.): Anytime preplant ; anytime before  
canarygrass emergence ; no limit on application number or frequency

Limitations (Harvest Interval, etc.): Not applicable.

Special Safety Precautions (if any): None.

Other Interested States/Agencies: Several other northern tier states.

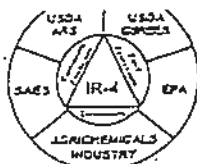
Comments:

Submitted by: Name, Signature, Date William H. Ahrens Willie H. Ahrens 8/19/94

IR-4 Project, Cook College, Rutgers University, P.O. Box 231, New Brunswick, N.J. 08903 Ph: 201-932-9575

NOTE: Use Reverse Side for Additional Information.

03/77



## IR-4 Minor Use Pesticide Clearance Request Form

| FOR OFFICE USE ONLY |                   |
|---------------------|-------------------|
| Date: <u>11/95</u>  | PR. # <u>6114</u> |
| Cal.: _____         |                   |

1. Requester:

Name: William H. Ahrens Affiliation: North Dakota State Univ.  
Address: Plant Sci. Dept.  
City: Fargo State: ND Zip: 58105  
Phone: (701) 231 8156 FAX: (701) 231 8474

2. Pesticide: (Common Name/ Mfg.): glyphosate / Monsanto

3. Commodity: (Complete one form per crop):

Crop: crambe  
Use site (field, greenhouse, post-harvest etc.): preplant or pre-emergence burndown  
Parts Consumed: \_\_\_\_\_ Animal Feed By-Products Yes ☐ No ☐  
Planting Season: early May  
Harvest Season: September  
Local Acreage: 35-40,000 % National: ?

4. Target Pest(s)/Potential Effects: broadleaf + grass weeds

5. Why is this use needed?: Control existing vegetation at planting time (mostly for no-till production).

6. Proposed Labeling:

Trade Name / Formulation: Roundup / 3 lb ac / gal soluble liquid  
Dosage Rate (Active Ingredient/Acre): 0.19 - 0.75 lb ac / A  
Application Parameters: (Type of sprayer, volume range, etc.): ground sprayer  
Directions for Use (Timing, No. Appl., Frequency, etc.): Apply before crop emerges

Limitations (Preharvest interval, total amount of a.i./acre/year): \_\_\_\_\_

Special Safety Precautions (If Any): \_\_\_\_\_

7. Supporting Data Availability\*: (Check appropriate items):

\_\_\_\_\_ Phytotoxicity(P) \_\_\_\_\_ Pest Control(E) \_\_\_\_\_ Yield(Y) \_\_\_\_\_ All(P,E,Y) \_\_\_\_\_ Other

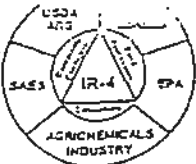
\*Preliminary data may be required to support your request.

8. Submitted By:

Name: William H. Ahrens Signature: Will H. Ahrens Date: 10 / 9 / 95

See Reverse Side for Directions and  
Additional Space for Comments

IR-4 Project, Cook College, Rutgers University  
P.O. Box 231, New Brunswick, NJ 08903  
Phone (908) 932-9575 • FAX # (908) 932-8481



## IR-4 Minor Use Pesticide Clearance Request Form

|                       |       |
|-----------------------|-------|
| FOLIO OFFICE USE ONLY |       |
| Date: 11/95           | 6115  |
| Cal.:                 | PR. # |

1. Requester:

Name: William H. Ahrens Affiliation: North Dakota State Univ.  
Address: Plant Sci. Dept.  
City: Fargo State: ND Zip: 58105  
Phone: (701) 231 8156 FAX: (701) 231 8474

2. Pesticide: (Common Name/Reg.): glyphosate / Monsanto  
3. Commodity: (Complete one form per crop):  
Crop: flax  
Use site (field, greenhouse, post-harvest etc.): preplant or postplant, before crop emerges.  
Parts Consumed: - Animal Feed By-Products Yes ☒ No ☐  
Planting Season: early to mid May  
Harvest Season: September  
Local Acreage: 300,000 % National: 80%  
4. Target Pest(s)/Potential Effects: grass and broadleaf weeds

5. Why is this use needed?: As a "burndown" in no-till to control existing weed vegetation at planting.

6. Proposed Labeling:

Trade Name/Formulation: Roundup / soluble liquid, 3 lb ac/gal  
Dosage Rate (Active Ingredient/Acre): 0.188 - 0.75 lb ac/A  
Application Parameters: (Type of sprayer, volume range, etc.): ground sprayer 500  
Directions for Use (Timing, No. Appl., Frequency, etc.): just before or just after planting; before crop emergence  
Limitations (Preharvest interval, total amount of a.i./acre/year):  
Special Safety Precautions (If Any):

7. Supporting Data Availability: (Check appropriate items):

☐ Phytotoxicity(P) ☐ Pest Control(E) ☐ Yield(Y) ☐ All (P,E,Y) ☐ Other

\*Preliminary data may be required to support your request.

8. Submitted By:

Name: William H. Ahrens Signature: Will H. Ahrens Date: 10/6/95

See Reverse Side for Directions and  
Additional Space for Comments

IR-4 Project, Cook College, Rutgers University  
P.O. Box 231, New Brunswick, NJ 08903  
Phone (908) 932-9575 • FAX # (908) 932-8481